IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

MICROSOFT CORPORATION,)	
Plaintiff,)	
v.)	C.A. No. 07-090 (SLR)
ALCATEL-LUCENT ENTERPRISE and GENESYS TELECOMMUNICATIONS LABORATORIES, INC.,)	REDACTED – PUBLIC VERSION
Defendants.)	

DEFENDANT ALCATEL LUCENT ENTERPRISE'S OPENING BRIEF IN SUPPORT OF ITS MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT AND INVALIDITY OF ALL ASSERTED CLAIMS OF UNITED STATES PATENT NOS. 6,263,064 AND 6,728,357

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NATURE AND STAGE OF PROCEEDINGS

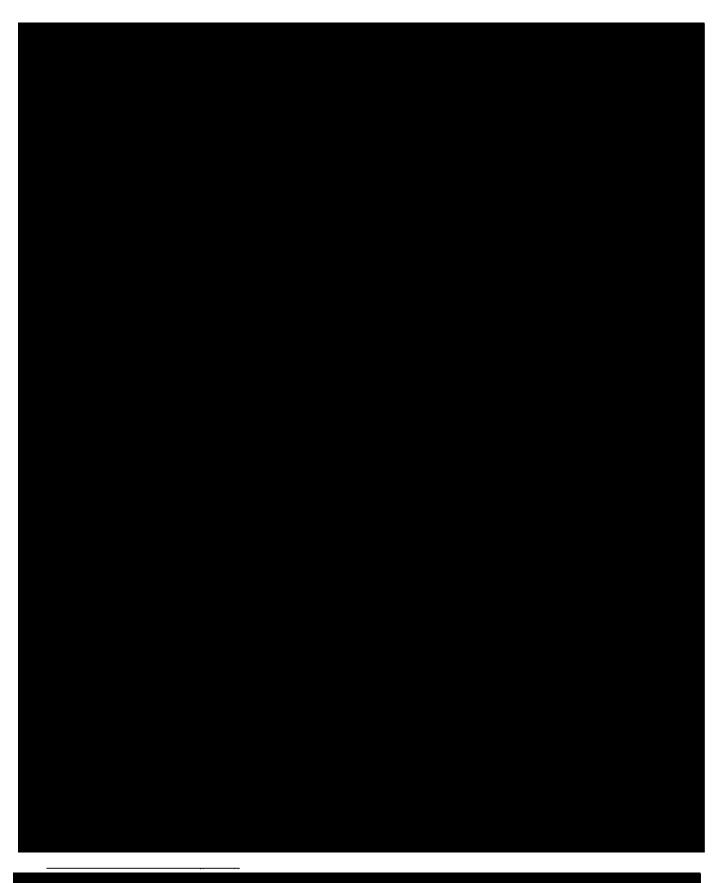
On February 16, 2007, Microsoft Corporation ("Microsoft") filed a complaint with the United States International Trade Commission alleging that Alcatel infringed four Microsoft patents ("the related ITC matter"). On the same day, Microsoft filed this action in for patent infringement, claiming that two PBX-software suite combinations manufactured and sold by Alcatel Lucent Enterprise ("ALE"), the OXE System and the OXO System, infringe certain of the same four Microsoft patents.

At issue in this motion are Microsoft's assertions that the ALE OXE System infringes claims 1, 3, 8, 9, 11 and 20 of U.S. Patent No. 6,263,064 ("the '064 Patent") and that the ALE OXE System infringes claims 1, 6 and 17 of U.S. Patent No. 6,728,357 ("the '357 Patent") (attached as Exs. 1 and 2), collectively referred to as "the O'Neal Patents". Summary judgment is warranted because the undisputed facts demonstrate that Microsoft cannot prove the accused products infringe, and further, demonstrate that the asserted claims of the O'Neal Patents are invalid as a matter of law because they are anticipated by the prior art.

SUMMARY OF ARGUMENT

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¹ The O'Neal Patents share an identical specification and present the same noninfringement and invalidity issues. Unless specifically noted otherwise, the O'Neal Patents are addressed together.



STATEMENT OF FACTS

A. Background of the Technology

The relevant technology is unified messaging. Unified messaging systems provide solutions for integrating various communication services, such as phone, fax, email, and other communication services. Unified messaging systems were well known prior to Microsoft's priority filing dates of the O'Neal Patents. (See Ex. 1 ('064 Patent) at 6:44-6:69; see also Declaration of Henry Hyde-Thomson In Support of Defendants' Motions for Summary Judgment of Non-Infringement and Invalidity of United States Patent Nos. 6,263,064, 6,728,357, 6,430,289, and 6,421,439, filed concurrently herewith ("Hyde-Thomson Decl.") at 4, ¶ 20; Ex. 5 (Hyde-Thomson ITC Hrg. Tr.) at 1228:19-1229:8.) The O'Neal Patents claim to provide an improved unified messaging system with a centralized communication center that allows subscribers of the system to modify their options for all their services either graphically through a single computer graphical user menu or telephonically through a telephony user interface. (See Ex. 1 ('064 Patent); Ex. 2 ('357 Patent).) Graphical User Interfaces (GUIs) were also well-known and widely used by the mid-1990s. (Hyde-Thomson Decl. at 4, ¶ 21.)

B. The O'Neal Patents

Microsoft asserts claims 1, 3, 8, 9, 11 and 20 of the '064 Patent and claims 1, 6 and 17 of the '357 Patent. The '064 Patent, entitled "Centralized Communication Control Center for Visually and Audibly Updating Communication Options Associated with Communication

Services of a Unified Messaging System and Methods Therefore," issued on July 17, 2001 to named inventors Stephen O'Neal and John Jiang. The '064 Patent derives from Application No. 09/239,585, filed on January 29, 1999. The '064 Patent is assigned to Microsoft.

The '357 Patent, entitled "Centralized Communication Control Center and Methods Therefor," issued on April 27, 2004 to named inventors Stephen C. O'Neal and John Jiang. The '357 Patent derives from Application No. 09/907,051, filed on July 17, 2001, which is a continuation of application no. 09/239,585. The '357 Patent shares the same specification as the '064 Patent. The '357 Patent is assigned to Microsoft.

The O'Neal Patents describe a method and apparatus for a computer-implemented centralized control center that permits:

a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal.

(Ex. 1 ('064 Patent) at Abstract).) The centralized control center includes a database that maintains a user's account and stores a user's "communication options [that] include parameters associated with individual ones of the communication services and routings among the communication services." (Id.) The control center has a computer server that "visually display[s] the communication options on one of the display terminals." (Id. at 4:29-31.) The computer server is configured to allow a user to make changes to his communication options from a computer via a graphical user interface ("GUI") or a telephone via a telephony user interface ("TUI"). (Id. at 4:58-65.)

The O'Neal Patents disclose using a single graphical menu as a "centralized control panel" to manage unified messaging options. (See Ex. 5 (Hyde-Thomson ITC Hrg. Tr.) at 1227:20-1228:7.) Similarly, one of the named inventors, John Jiang, testified that the

inventions described and claimed in the O'Neal Patents allow users to manage communication services through a centralized graphical user interface or a centralized telephonic user interface where the user can access all communication options on a single screen. (See Ex. 6 (Jiang ITC Dep. Tr.) at 58:20-59:10.)

C. The Accused OXE System is a Combination of Individual Communications Products





D. Person Of Ordinary Skill In The Art



ARGUMENT

A. APPLICABLE LEGAL STANDARDS

The applicable legal standards are set forth in ALE's accompanying Opening Brief in Support of its Motion for Summary Judgment of Non-Infringement and Invalidity of the Asserted Claims of United States Patent No. 6,421,439. For the reasons set forth below, the Court should grant ALE's request for summary judgment that the asserted claims of the O'Neal Patents are not infringed and/or are invalid.

- B. IF THE COURT ACCEPTS ALE'S CONSTRUCTION OF THE SINGLE GRAPHICAL MENU LIMITATION, THERE IS NO INFRINGEMENT
 - 1. The Accused OXE System Does Not Have a Single Menu That Displays All Options for All of a Subscriber's Services

If the Court finds that the single graphical menu limitation requires there to be one graphical menu that shows the communication options associated with a subscriber's communication services at the same time, then the accused OXE system does not meet that limitation.



Indeed, Microsoft conceded that the claims were not infringed in the related ITC proceeding based on ALE's construction of the single graphical menu limitation. The ITC Initial Determination found:

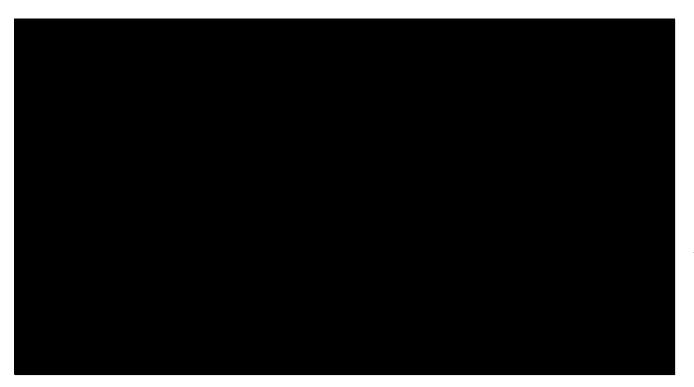
It is undisputed that the accused OXE system does not generate a single graphical menu that shows all of the communication options associated with a user's communication services at the same time. In fact, complainant's infringement arguments depend on its claim construction argument:

'Therefore, the evidence establishes that the accused OXE System meets the limitation of claim 1[c] <u>under Microsoft's proposed construction</u> because the OTUC servers running OTUC software generate several graphical menus each of which displays communication options for at least two communication services at the same time.'

Thus, complainant not only provided no argument that the accused products infringe under a different claim construction, but also admitted that several graphical menus are generated.

(See Ex. 15 (ITC Initial Determination) at 188 (internal citations omitted) (emphasis in original).)





2. There is No Infringement Under the Doctrine of Equivalents

Microsoft is precluded from asserting infringement under the doctrine of equivalents of the single graphical menu limitation, as a matter of law. As discussed in detail in Defendants' Markman Brief, when applicants narrow their claims during prosecution to facilitate patentability, as Microsoft did here with the addition of the single graphical menu limitation and accompanying remarks in view of prior art rejections, black letter law provides that prosecution estoppel history limits the doctrine of equivalents. *See Festo Corp. v. Shoketsu Kinzoku Co.*, 535 U.S. 722, 735-36 (2002). When, as here, there is a narrowing amendment through "the addition of a new claim limitation . . . equivalents are presumptively not available with respect to that limitation." *See Biagro Western Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1305 (Fed. Cir. 2005). Further, a finding that the graphical menu can display less than all of the communication options for all of the subscriber's communication services would vitiate the "for each" limitation. *See, e.g., Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1378 (Fed. Cir. 2005); *Asyst Techs. Inc. v. Emtrak, Inc.*, 402 F.3d 1188, 1195 (Fed. Cir. 2005).



A patentee cannot

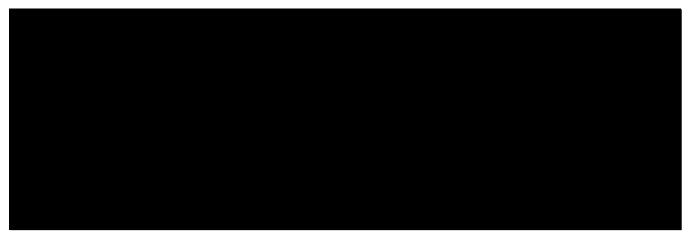
use the doctrine of equivalents to recapture claim scope that was given away during prosecution to overcome prior art. *See Festo*, 535 U.S. at 735-36.

For at least these reasons, the accused products do not directly infringe the asserted claims of the O'Neal Patents. Moreover, as there is no evidence of direct infringement, it is axiomatic that there can be no contributory or induced infringement either. *See Joy Techs.*, *Inc. v. Flakt, Inc.*, 6 F.3d 770, 774 (Fed. Cir. 1993).

- C. IF THE COURT ADOPTS ALE'S CONSTRUCTION OF THE TELEPHONY SERVER LIMITATION, THERE IS NO INFRINGEMENT
 - 1. The OXE System Does Not Have the Same Options Available Through the Telephone and Computer Interfaces

As set forth in ALE's Markman brief, the term "telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computer-implemented control center" requires that the telephony server audibly represent the same communications options that are available through the single graphical menu.





2. There Is No Infringement Under the Doctrine of Equivalents

Even though the telephony server limitation is not met by the accused system,



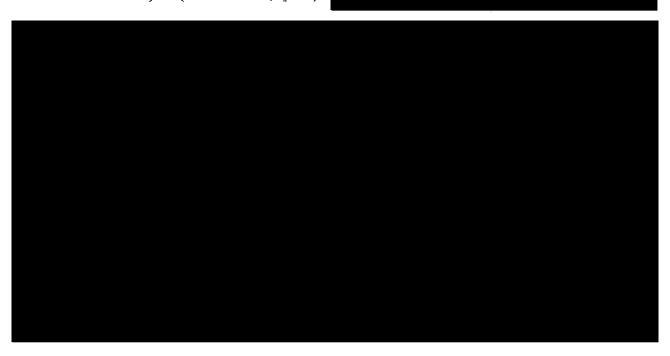
limitation would be vitiated if a "substantial number" of communication options were deemed sufficient. See id.; see Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29–30 (1997) (concluding that when applied correctly, "the doctrine will not vitiate the central functions of the patent claims themselves"); Moore U.S.A., Inc. v. Std. Register Co., 229 F.3d 1091, 1106 (Fed. Cir. 2000) (holding that "to allow what is undisputedly a minority (i.e., 47.8%) to be equivalent to a majority would vitiate" the limitation).

Accordingly,

for at least the above-discussed reasons, the accused combination of products do not infringe the asserted patent claims, directly or indirectly. *See Joy Techs.*, 6 F.3d at 774.

D. THE ACCUSED SYSTEM IS NOT A "UNIFIED MESSAGING SYSTEM" UNDER MICROSOFT'S CONSTRUCTION

The accused OXE system also does not infringe any of the asserted claims of the O'Neal Patents, all of which require a "unified messaging system," if Microsoft's construction of unified messaging system is adopted. (See Hyde-Thomson Decl. at 10, \P 41.) Microsoft's construction of that limitation requires a "system that allows messages of a data-centric network and telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e., in a coordinated manner)." (See id. at 10, \P 40.)



ALE's proposed construction of the Unified Messaging System limitation requires a "system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded to the communication devices or

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networks employed for the transmission of the messages." See id. at 10, \P 40.

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E. THERE IS NO INDIRECT INFRINGEMENT BECAUSE THE ACCUSED PRODUCTS HAVE SUBSTANTIAL NON-INFRINGING USES

A patent cannot be used to block commerce in something it does not claim. A strictly limited exception to this fundamental principle is 35 U.S.C. § 271(c)'s "contributory infringement" provision. Specifically, Section 271(c) permits, with several exceptions and restrictions, a patent owner to block sales of a product that <u>inevitably</u> causes direct infringement of the patent. However, because a product with a non-infringing use does <u>not</u> inevitably lead to direct infringement, it is <u>not</u> contributory infringement to sell such a product. See Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 200 (1980); Alloc, Inc. v. Int'l Trade Comm'n, 342 F.3d 1361, 1374 (Fed. Cir. 2003).

The Supreme Court's narrow interpretation of Section 271(c) recognizes that permitting patent owners to extend their patent monopolies beyond the limits of the specific grant can discourage innovation and harm competition, which is contrary to the Constitutional purpose of the Patent System. "[I]n contributory infringement cases . . . the Court has always recognized the critical importance of not allowing the patentee to extend his monopoly beyond the limits of his specific grant. These cases deny the patentee any right to control the distribution of unpatented articles unless they are 'unsuited for any commercial noninfringing use'." *Dawson Chemical*, 448 U.S. at 198. Unless a staple "has no use except through practice of the patented method," the patent owner has no right to claim that its distribution constitutes contributory infringement. *Id.* at 199 (emphasis added). "Congress granted to patent holders a statutory right

Section 271(c) provides: "Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer."

to control nonstaple goods that are capable only of infringing use in a patented invention, and that are essential to that invention's advance over prior art." *Id.* at 213.

This same restriction applies to inducement infringement under 35 U.S.C. § 271(b). See Dynacore Holdings Corp. v. U.S. Philips Corp., 363 F.3d 1263, 1275 (Fed. Cir. 2004) ("The mere sale of a product capable of substantial non-infringing uses does not constitute indirect infringement of a patent."). This restriction applies to products that have multiple uses, even if the seller knows that its multi-use product is sometimes used in an infringing manner; and such knowledge is "legally irrelevant." Warner-Lambert Co. v. Apotek Corp., 316 F.3d 1348, 1364 (Fed. Cir. 2003).

The relevant inquiry when determining whether an accused product has a substantial noninfringing use relates to the item sold, not to some allegedly infringing function or configurations of the accused product:

Section 271(c) requires examination of the patented method only in determining whether the material the accused actually sells constitutes a material part of the invention and is known by the accused to be especially made or adapted for use in infringing the patent. Neither party here "sells" potassium nitrate, and Block's attempted limitation of the staple/nonstaple inquiry to that mere ingredient would eliminate the § 271 (c)-mandated inquiries relating to whether what was actually sold was a material part of the invention and whether the seller knew that what was actually sold was especially made or adapted for use in infringement of the patent.

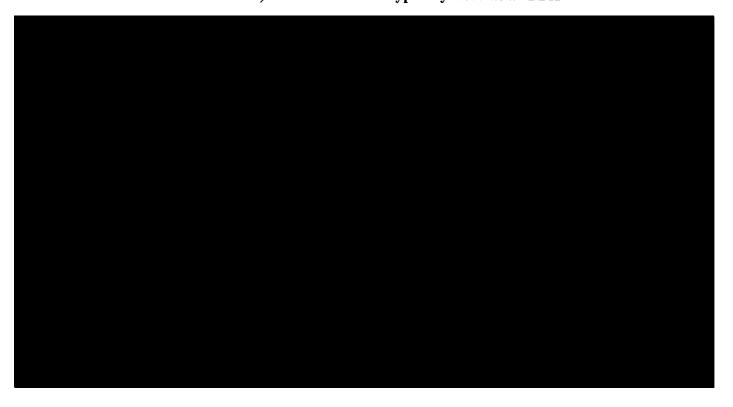
Hodosh v. Block Drug Co., 833 F.2d 1575, 1578 (Fed. Cir. 1987) (footnote omitted).

Thus, a patentee must actually prove that the accused products were used in an infringing manner. See Dynacore Holdings, 363 F.3d at 1272 (providing that indirect infringement requires, as a predicate, a finding that some party amongst the accused actors has committed the entire act of direct infringement.); Joy Techs., 6 F.3d at 773 (requiring that for process patent or method patent claims, infringement only occurs when a party performs all of

the steps of the process). Where accused products can be used in multiple ways and/or configurations, one of which does not infringe, there is no indirect infringement. As discussed below, Microsoft has accused the combination of products, which alone do not infringe, and thus, Microsoft must prove that the accused products were used by some party in the accused combination in an infringing manner.

Accordingly, regardless of the disputed claim constructions, Microsoft cannot meet its burden of proof to show contributory or induced infringement of the accused products because the accused products have substantial non-infringing uses. (See Hyde-Thomson Decl. at 6, ¶ 28.) Microsoft has accused a combination and specific configuration of different products, many of which can be used, and are often sold, separately and have substantial non-infringing uses.

- 1. The Omni PCX Enterprise Switch is a PCX with Substantial Uses Microsoft Acknowledges Are Noninfringing
 - a) The OXE is Typically Used as a "PBX"





b) The Omni PCX Enterprise Switch Can Be
Used with Third Party Enhancement
Software, Providing Additional
Noninfringing Uses

2. Microsoft Cannot Show Induced Infringement by ALE Because It Cannot Show Specific Intent To Encourage Infringement By Others

Microsoft cannot meet its burden of proof for induced infringement. Induced infringement under 35 U.S.C. § 271(b) requires a specific intent to encourage another to infringe the patent. Merely encouraging the acts that turn out to be an infringement is not enough. The defendant must: (1) know of the patent and intend; and (2) actively encourage its infringement:

[T]he intent requirement for inducement requires more than just intent to cause the acts that produce direct infringement. Beyond that threshold knowledge, the inducer must have an affirmative intent to cause direct infringement. In the words of a recent decision, inducement requires "that the alleged infringer knowingly induced infringement and possessed specific intent to encourage another's infringement." MEMC Elec., 420 F.3d at 1378 (Fed. Cir. 2005) (quoting Minn. Mining & Mfg. Co. v. Chemque, Inc., 303 F.3d 1294, 1304-05 (Fed. Cir. 2002)). Accordingly, inducement requires evidence of culpable conduct, directed to encouraging another's infringement, not merely that the inducer had knowledge of the direct infringer's activities. (Citations omitted).

DSU Med. Corp. v. JMS Co., 471 F.3d 1293, 1306 (Fed. Cir. 2006) (en banc in relevant part).

Microsoft has no qualified expert opinion or other evidence meeting its burden on this issue. In particular, there is no evidence that any managing agent (or agent at all) both (1) knew of the O'Neal Patents; and, more importantly, (2) "knowingly induced infringement and possessed specific intent to encourage another's infringement" using ALE's accused products.

3. Microsoft Cannot Show Indirect Infringement by ALE Because It Cannot Show Performance of All of the Steps of the Method Claim Using the Accused Products

To directly infringe a method claim, under 35 U.S.C. § 271(a)⁵, one must perform each step of the claimed method in the U.S., without authority of the patent owner. NTP, Inc. v. Research In Motion, Ltd., 418 F.3d 1282, 1318 (Fed. Cir. 2005); E-Pass Techs., Inc. v. 3Com Corp., 473 F.3d 1213, 1223 (Fed. Cir. 2007). Distributing information or tools that may be used by others to perform a patented method, does not directly infringe a method patent claim. See Joy Techs., 6 F.3d at 774 ("the sale of equipment to perform a process is not a direct infringement of the process"); Mendenhall v. Cedarapids, Inc., 5 F.3d 1557, 1579 (Fed. Cir. 1993) (holding that the manufacture and sale of a product cannot directly infringe a method patent unless the product is actually used in the United States by the claimed method). Nor does selling a product capable of being used in the patented manner suffice to meet this standard. See, e.g., Ormco Corp. v. Align Tech., Inc., 463 F.3d 1299, 1310-11 (Fed. Cir. 2006) (rejecting district court holding that a method claim would be infringed by selling dental position adjustment devices merely capable of infringing.)

It is axiomatic that without direct patent infringement, there can be no indirect patent infringement. "Liability for either active inducement of infringement or for contributory infringement is dependent upon the existence of direct infringement." Joy Techs, 6 F.3d at 774; see also Aro Mfg. Co. v. Convertible Top Replacement Co., 365 U.S. 336, 341 (1961) (holding that it is a "fundamental precept that there can be no contributory infringement in the absence of a direct infringement."); Novartis Pharm. Corp. v. Eon Labs Mfg., 363 F.3d 1306, 1308 (Fed.

[&]quot;Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent." 35 U.S.C. § 271(a).

Cir. 2004) ("When indirect infringement is at issue, it is well settled that there can be no inducement or contributory infringement absent an underlying direct infringement."); *Dynacore Holdings*, 363 F.3d at 1272 ("[i]ndirect infringement, whether inducement to infringe or contributory infringement, can only arise in the presence of direct infringement.").

Thus, for each asserted method patent claim and for each accused product offering of ALE, Microsoft must prove that a third-party directly infringed the asserted method claim in the U.S. using such product(s). See Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 1272 (Fed. Cir. 1986) (direct infringement may be proven by circumstantial evidence). Claim 6 of the '357 Patent recites a patented method. See Ex. 2 ('357 Patent) at 19:43-50. Thus, to show infringement of this method claim, Microsoft must prove that a third-party actually used the accused products in the United States to perform the functions Microsoft alleges infringe. See Ormco, 463 F.3d at 1310-11. Microsoft has offered no such evidence and has not cited any such evidence in its infringement expert report. (See Ex. 16 (Beckmann Rebuttal Report) at passim.) Thus, Microsoft cannot succeed on its claim of infringement of claim 6 of the '357 Patent for this additional reason.

F. UNDER MICROSOFT'S PROPOSED CONSTRUCTIONS, THE ASSERTED CLAIMS OF THE O'NEAL PATENTS ARE INVALID

Anticipation requires that two steps be met. First, the prior art must be shown to qualify as "prior art." Second, the prior art must be shown to disclose all limitations of the patent claim at issue. *In re Donohue*, 766 F.2d 531, 534 (Fed. Cir. 1983). Here, the asserted claims of the O'Neal Patents are invalid as anticipated by the Swartz Patent and the Nagai Patent in view of Microsoft's own proposed constructions.

1. The Claims of the O'Neal Patent Are Anticipated by the Swartz Patent

The Swartz Patent was filed on March 2, 1998, and issued on September 3, 2002, qualifying it as prior art to the O'Neal Patents under 35 U.S.C. § 102(e). The Swartz Patent was not cited during the U.S. Patent & Trademark Office ("PTO") examination of the O'Neal Patents, and thus, this prior art was not considered by the PTO. See KSR Intern. Co. v. Teleflex Inc., 127 S. Ct. 1727, 1745-46 (2007) (suggesting that the burden for proving invalidity is more easily met when the closest prior art was not considered by the PTO). See Am. Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1359 (Fed. Cir. 1984) (noting that "[w]hen an attacker... produces prior art or other evidence not considered in the PTO, there is . . . no reason to defer to the PTO so far as its effect on validity is concerned") (emphasis original). The Swartz Patent is well documented and presumed enabled. See Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1354 (Fed. Cir. 2003).

An anticipatory reference renders a patent invalid if it discloses each and every element of the claimed invention. *See In Re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Based on Microsoft's own constructions of the disputed claim terms, the Swartz Patent anticipates each and every asserted claim of the O'Neal Patents under 35 U.S.C. § 102(e). (Hyde-Thomson Decl. at 18, ¶ 72;) *see id.* at 18-21, ¶¶ 73-77 (detailing the anticipating disclosures of the Swartz Patent for each of the asserted claims of the '064 Patent), *see id.* at 21, ¶ 78 (detailing the anticipating disclosures of the Swartz Patent for each of the asserted claims of the '357 Patent).

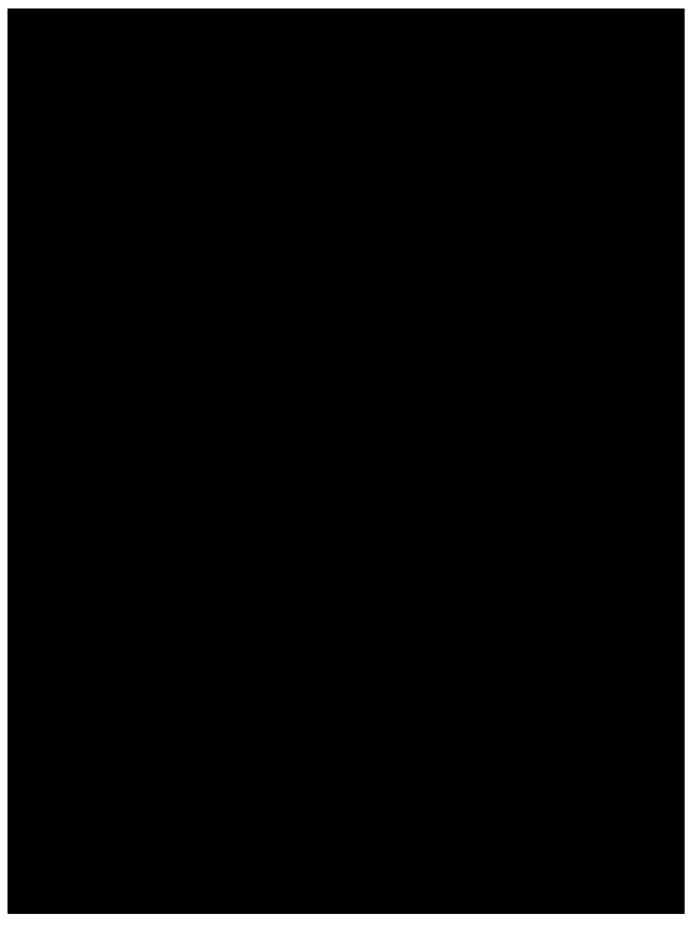
Applying Microsoft's proposed constructions, the only disputed issue is whether the Swartz Patent discloses a "unified messaging system." As discussed below, there is no question that the Swartz Patent discloses this claim limitation, under either Microsoft's proposed

construction or Defendants' construction, and thus, the O'Neal Patents are invalid as anticipated under 35 U.S.C. § 102.

a) The Swartz Patent Discloses "a Unified Messaging System"

The parties disagree over the meaning of "unified messaging system." Microsoft's construction of the "unified messaging system" limitation is a "system that allows messages of a data-centric network and telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e. in a coordinated manner)." (See Ex. 21 (Joint Statement (D.I. 150)) at 4; Hyde-Thomson Decl. at 10, ¶ 40.) ALE, in contrast, proposes that the limitation means a "system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded to the communication devices or networks employed for the transmission of the messages." (See Hyde-Thomson Decl. at 10, ¶ 40.) Under either construction, the asserted claims of the O'Neal Patents are invalid as anticipated by Swartz (and Nagai as discussed further below).

Under Microsoft's proposed construction of this limitation, the Swartz Patent discloses a unified messaging system because it "provides the facilities needed <u>for controlling a</u> variety <u>of communications services</u>, including telephone, email, <u>fax</u> and paging services provided by a host services computer operating under the control of either or both (1) a World Wide Web interface and (2) a telephone interface." (*See* Ex. 3 (Swartz Patent) at col. 2:2-7; Hyde-Thomson Decl. at 18-19, ¶ 73.) In short, the Swartz Patent discloses a system allowing a user to store, retrieve, forward and review messages of a data-centric and telephony-centric network without regard to the retrieval device.



2. The Claims of the O'Neal Patents Are Anticipated by the Nagai Patent

The Nagai Patent was filed on June 24, 1998, and issued on October 1, 2003, qualifying it as prior art to the O'Neal Patents under 35 U.S.C. § 102(e). The Nagai Patent was not cited during the U.S. Patent & Trademark Office ("PTO") examination of the O'Neal Patents, and thus, this prior art was not considered by the PTO. The Nagai Patent is well documented and an enabling reference. *See Amgen*, 314 F.3d at 1354; (Hyde-Thomson Decl. at 21-22, ¶¶ 79-81.)

As with Swartz, the Nagai Patent anticipates each and every asserted claim, based on Microsoft's proposed constructions, of the O'Neal Patents 35 U.S.C. § 102(e). (Hyde-Thomson Decl. at 21-22, ¶¶ 79-81; *id* at 21-22, ¶¶ 79-80 (detailing the anticipating disclosures of the Nagai Patent for each of the asserted claims of the '064 Patent), *id* at 22, ¶ 81 (detailing the anticipating disclosures of the Nagai Patent for each of the asserted claims of the '357 Patent).

Applying Microsoft's proposed constructions, the pertinent issue is whether the Nagai Patent discloses the Unified Messaging System limitation.⁶ As discussed below, there is no question that the Nagai Patent discloses this claim limitation, under either Microsoft's proposed construction or ALE's construction, and thus, the O'Neal Patents are invalid as anticipated under 35 U.S.C. § 102(e).

a) The Nagai Patent Discloses a Unified Messaging System

Tellingly, the Nagai Patent explicitly describes the disclosed system as a "unified messaging system." (See Ex. 4 (Nagai Patent) at 5:14-30, 7:62-8:6.) More specifically, the

Microsoft has also posited that the Nagai Patent does not anticipate claim 8. (See Ex. 16 (Beckmann Rebuttal Report) at 11.) This argument, however, is based on the application of ALE's proposed construction of the single graphical menu limitation. Thus, applying Microsoft's proposed constructions and application of such proposed constructions, Nagai also anticipates claim 8 of the '064 Patent. (See Hyde-Thomson Decl. at 21, ¶ 79.)

Nagai Patent teaches "a groupware server 203 for providing a <u>unified messaging service for unified messaging of voice, text and facsimile mail</u>". (*See id.* at 7:62-8:6.) Moreover, the Nagai Patent does indeed disclose what it so evidently states to do. (*See* Hyde-Thomson Decl. at 21-22, ¶ 80; Ex. 5 (Hyde-Thomson ITC Hrg. Tr.) at 1321:17-1327:6.) Indeed, Mr. Hyde-Thomson has highlighted a portion of the Nagai Patent that "ends with the phrases: Means for unified messaging for multimedia electronic mail, desirably, such as voice mail, facsimile mail and text mail" and concluded that "[i]t clearly is describing a unified messaging system." (*See* Hyde-Thomson Decl. at 21-22, ¶ 80; Ex. 5 (Hyde-Thomson ITC Hrg. Tr.) at 1321:17-1327:6.)

Despite the fact that the Nagai Patent clearly discloses a unified messaging system, and despite acknowledging that "the disclosed system . . . [is] labeled as a 'unified messaging system,'" Microsoft's expert

The applicants for the O'Neal Patents did not give any special meaning to the term "unified messaging system". Thus, one possessing ordinary skill in the art reading the Nagai Patent's explicit disclosure of a "unified messaging system" would understand the term to possess the same meaning as the term used in the O'Neal Patents. (Ex. 4 (Nagai Patent) at passim; see also Hyde-Thomson Decl. at 21-22, ¶ 80.)



CONCLUSION

For the reasons discussed above, ALE respectfully requests that the Court grant summary judgment that ALE does not infringe any of Microsoft's asserted claims of the O'Neal Patents under 35 U.S.C. § 271 and that the asserted claims of the O'Neal Patents are invalid under 35 U.S.C. § 102.

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May 9, 2008 2322318

CERTIFICATE OF SERVICE

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> Thomas L. Halkowski, Esquire FISH & RICHARDSON P.C.

I also certify that copies were caused to be served on May 16, 2008 upon the following in the manner indicated:

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EXHIBIT 1

(12) United States Patent O'Neal et al.

(10) Patent No.:

US 6,263,064 B1

(45) Date of Patent:

*Jul. 17, 2001

(54) CENTRALIZED COMMUNICATION
CONTROL CENTER FOR VISUALLY AND
AUDIBLY UPDATING COMMUNICATION
OPTIONS ASSOCIATED WITH
COMMUNICATION SERVICES OF A
UNIFIED MESSAGING SYSTEM AND
METHODS THEREFOR

(75) Inventors: Stephen C. O'Neal, San Francisco; John Jiang, Danville, both of CA (US)

(73) Assignee: International ThinkLink Corporation, San Francisco, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/239,585(22) Filed: Jan. 29, 1999

(51) Int. Cl.⁷ H04M 3/4

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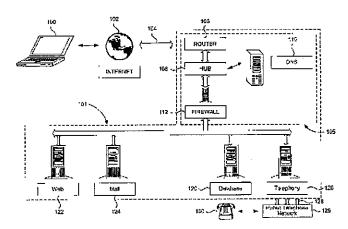
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Primary Examiner—Scott L. Weaver Assistant Examiner—Roland G. Foster (74) Attorney, Agent, or Firm—Beyer Weaver & Thomas, LLP

(57) ABSTRACT

A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal is disclosed. The computer implemented control center includes a subscriber communication profile database having therein an account pertaining to the subscriber. The account includes the communication options for the subscriber. The communication options include parameters associated with individual ones of the communication services and routings among the communication services. There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on the display terminal when the subscriber employs the display terminal to access the computer-implemented control center through the data-centric network. The computer server is also configured to receive from the subscriber via the display terminal a first change to the communication options and to update the first change to the account in the subscriber communication profile database. There is also included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to the telephone when the subscriber employs the telephone to access the computer-implemented control center. The telephony server is also configured to receive from the subscriber via the telephone a second change to the communication options and to update the second change to the account in the subscriber communication profile database.

20 Claims, 6 Drawing Sheets



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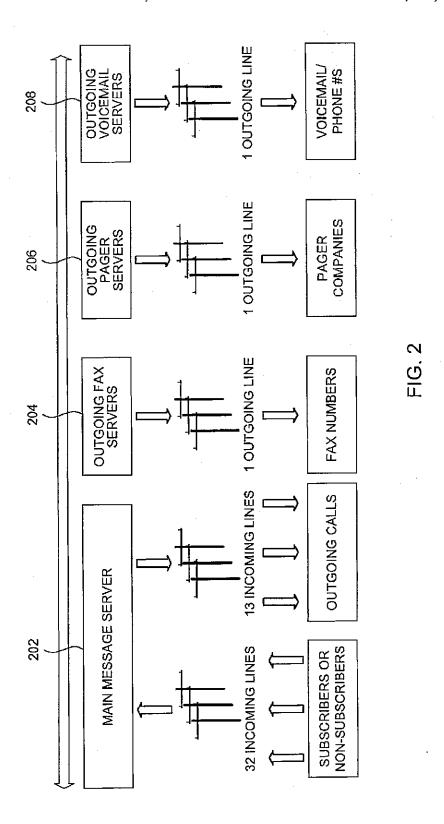
U.S. Patent US 6,263,064 B1 Jul. 17, 2001 Sheet 1 of 6 105 DNS Telephony Database FIREWALL ROUTER HUB FIG. 1 INTERNET Mail 101 Web

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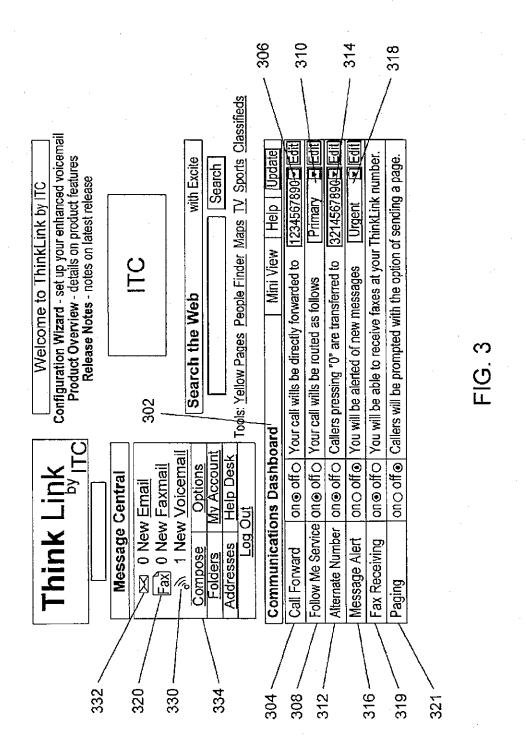


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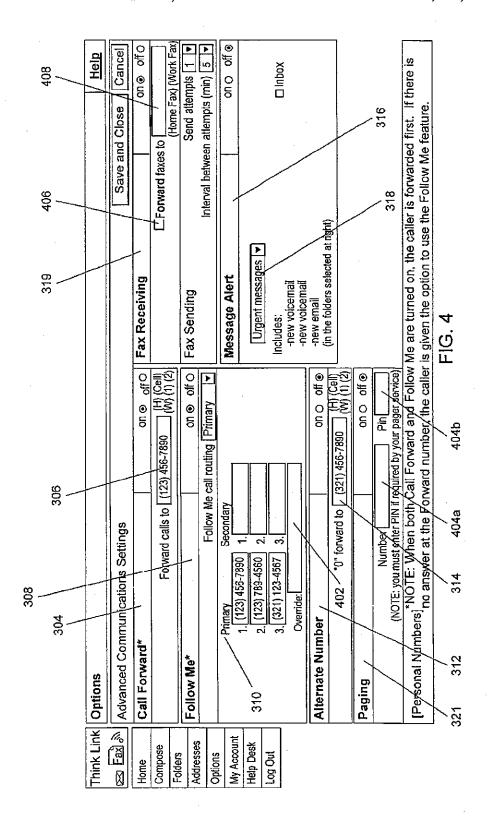


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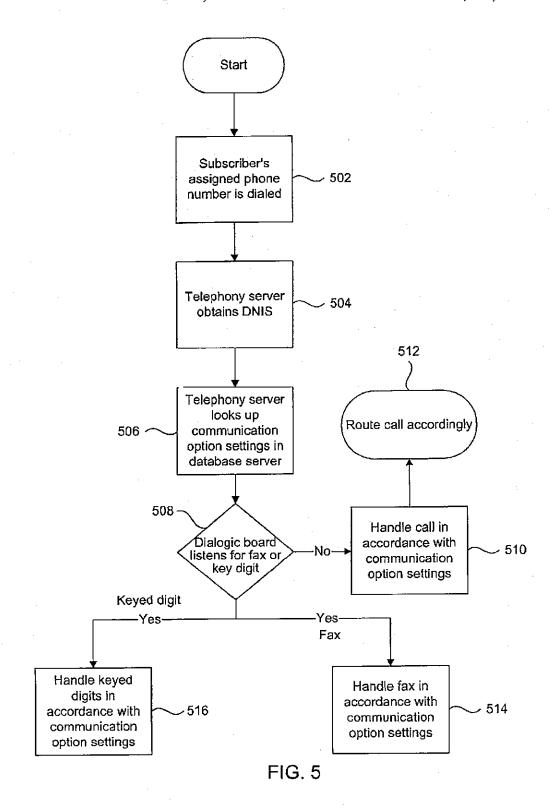


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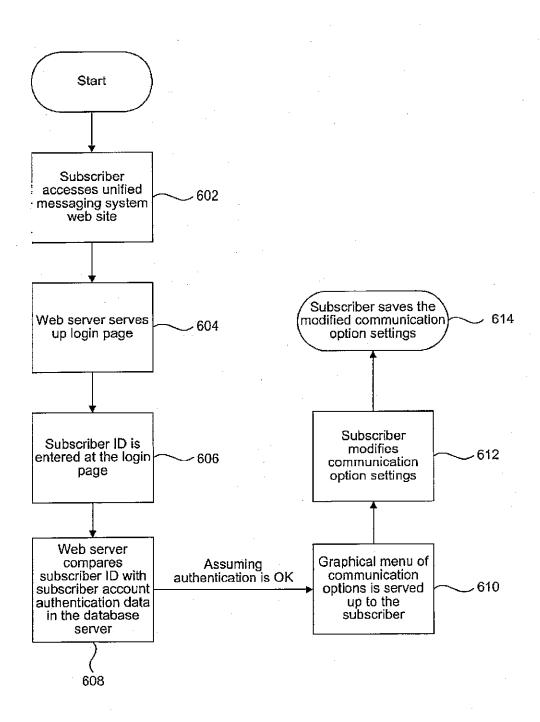


FIG. 6

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CENTRALIZED COMMUNICATION CONTROL CENTER FOR VISUALLY AND AUDIBLY UPDATING COMMUNICATION OPTIONS ASSOCIATED WITH COMMUNICATION SERVICES OF A UNIFIED MESSAGING SYSTEM AND METHODS THEREFOR

RELATED APPLICATIONS

The following commonly-owned, co-pending patent applications are related and are incorporated herein by reference.

Ser. No. 09/239,560, filed Jan. 29, 1999, entitled "INTE-GRATED MESSAGE STORAGE AND RETRIEVAL SYS- 15 TEM DISTRIBUTED OVER A LARGE GEOGRAPHI-CAL AREA":

Scr. No. 09/240,367, filed Jan. 29, 1999, entitled "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITH A THIN WEB 20 BROWSER";

Ser. No. 09/239,584, filed Jan. 29, 1999, entitled "COMPUTER-IMPLEMENTED CALL FORWARDING OPTIONS AND METHODS THEREFOR IN A UNIFIED MESSAGING SYSTEM";

Ser. No. 09/240,893, filed Jan. 29, 1999, entitled "INTER-ACTIVE BILLING SYSTEM UTILIZING A THIN WEB CLIENT INTERFACE":

SYSTEM AND METHOD TO MANAGE PHONE SOURCED MESSAGES";

Ser. No. 09/240,434, filed Jan. 29, 1999, entitled "METHOD AND APPARATUS FOR NETWORK INDE-PENDENT INITIATION OF TELEPHONY";

Scr. No. 09/240,435, filed Jan. 29, 1999, entitled "APPA-RATUS AND METHOD FOR DEVICE INDEPENDENT MESSAGING NOTIFICATION";

Ser. No. 09/240,436, filed Jan. 29, 1999, entitled "APPA-RATUS AND METHOD FOR CHANNEL- 40 TRANSPARENT MULTIMEDIA BROADCAST MES-SAGING";

Ser. No. 09/240,589, filed Jan. 29, 1999, entitled "VOICE ACCESS TUROUGH A DATA-CENTRIC NETWORK TO AN INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM".

BACKGROUND OF THE INVENTION

The present invention relates to communication services 50 available via a data-centric network (i.e., a network that carries digital data) and a telephony-centric network (i.e., a network that carries telephony information such as voice, fax, pager, and the like). More particularly, the present invention relates to a centralized facility and methods there- 55 for that allow a subscriber of various communication services to review and customize his communication options, in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

Both the data-centric network (e.g., a distributed com- 60 puter network) and the telephony-centric network (e.g., public telephone network) have existed for some time. Broadly speaking, the data-centric network (such as the Internet) may be thought of as a global computer network that connects millions of computer terminals all over the 65 world in such a way that digitized information can be exchanged irrespective of the different hardware and soft2

ware platforms that may be utilized to gain access to the data-centric network. People and businesses around the world use the data-centric network to retrieve information, communicate and conduct business globally, and access a vast array of services and resources on-line. In a similar manner, the telephony-centric network (whether wired or wireless) may also be thought of as another global network that connects the millions of telephony devices (such as voice-oriented telephones, pagers, facsimile machines, voice mail boxes, and the like) together in such a way that a user at one of the telephony devices can readily transmit information to other telephony devices irrespective of geographic boundaries.

In the past, these two networks existed as separate domains. This is because the widely accessible data-centric network is a fairly recent phenomenon. For decades, the only network that has been available to the masses is the analog telephony-centric network, starting with the telegraph network of the nineteenth century. However, as more and more of the services traditionally offered through the telephony-centric network are being offered in a digital format by the data-centric network, the distinction between the data-centric network and the telephony-centric network begins to blur. Irrespective of whether these two networks exist as separate networks physically or conceptually going forward, the logacies of their separate existence can be seen in the various different communication services and communication devices that currently exist.

By way of example, there exist many different commu-Scr. No. 09/240,368, filed Jan. 29, 1999, entitled "A 30 nication devices and services available today to allow a person to communicate to another person, e.g., telephones, facsimile machines, electronic mail (e-mail), pagers, voice mail, and the like. Generally speaking, a telephone is a communication device employed to transmit and receive speech and other sounds. A facsimile machine is a communication device to transmit and receive graphical data. A pager is a highly portable device that allows its user to receive data, and in some cases transmit limited data to a pager service provider. A voice mail box is essentially a service that allows one person to temporarily store telephone messages for retrieval by another. E-mail services allow e-mail users to transmit and receive data from computer terminals connected to the data-centric network. All these devices and services are well known in the art and will not be elaborated further for the sake of brevity.

> Currently, these communication services are viewed, both hy the service providers who create and maintain the network infrastructure and the subscribers who employ the devices and networks for communication, as separate services. This is due, partly but not entirely, to past government deregulation efforts and gradual technological evolution that have given rise to different service providers, all competing to provide the communication services to individual consumers. Thus, it is not unusual for a consumer to have an e-mail account with one service provider, a telephone account with another service provider and a pager account with yet another service provider. Even if the different services are contracted through a single service provider, the dual existence of the data-centric network and the telephony-centric network, as well as existing billing and account management infrastructures, often force the service provider to manage each of these services as a separate account.

One of the consequences of baving different accounts for different services is the proliferation of telephone numbers, facsimile numbers, and pager numbers that a typical consumer must deal with. Thus, it is not at all unusual for a

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consumer to have a home telephone number, a work telephone number, one or more cellular telephone numbers, a pager number, and a facsimile number, with each of these numbers being assigned to a different communication device. Not only are these various numbers difficult to s remember for the consumer, they are confusing to others.

A more serious consequence is the burden on the consumer who needs to manage the communication options associated with the different services (which are now assigned to different physical devices and managed as 10 different accounts) to ensure that incoming and outgoing messages are properly handled. By way of example, a person who travels may wish to forward voice calls made to his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to 15 divert facsimiles sent to his office facsimile machine to a facsimile machine that is more local. While in a meeting, however, he may wish to temporarily divert the voice calls to his voice mail box or forward it to another person for handling. To stay in touch, these communication options 20 may need to be changed many times during the course of the day and/or each time he arrives at a new location.

To accomplish the above, the person in the above example currently needs to lirst ascertain the current communication option settings associated with the various services that he uses. Unless he is diligent in noting and/or remembering the recent changes in the communication option settings, he may need to call cach of the service providers to find out what the current communication option settings are. Assuming that he knows the current communication option settings and such calls need not be made, the user most still access each communication device and/or contact each service provider to reroute the incoming and outgoing messages.

By way of example, some facsimile machines currently allow the user to forward the incoming facsimile to another facsimile machine by entering a particular combination of the forwarding number and predefined codes on the facsimile machine keypad. Likewise, many telephone systems require the user to physically enter the forwarding telephone number and predefined codes on the keypad of the telephone from which forwarding originates. However, this requires the user to be physically present at the facsimile machine or telephone from which forwarding originates. If he owns one of these telephones or facsimile machines and is on the road, such forwarding would not be possible absent help from another person who has such physical access.

The fact that each communication service is treated as a different account also requires the user in the example above to access each account and/or service provider to accomplish the changes. Thus, multiple calls may need to be made to change the communication option settings associated with the different communication services. Even with automated response systems in place to handle such changes, these calls take time and can aggravate even the most patient users.

55 especially if multiple calls need to be made to the multiple service providers each time the moves from one location to another. As can be appreciated by those skilled in the art, such approach is at best time consuming and unwieldy.

More typically, a busy user would just not bother changing the communication options associated with the various communication devices that he owns. He would rather suffer the possibility of missing out on some messages than constantly contacting the different service providers and making changes on individual services. In this case, the communication services that he owns are not employed to their fullest potential.

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In view of the forgoing there are desired improved techniques for allowing a user of communication services to review and customize the communication options associated with these services in a simplified and convenient manner.

SUMMARY OF THE INVENTION

The invention relates, in one embodiment, to a computerimplemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options is accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The computerimplemented control center includes a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on one of the display terrinals when the subscriber employs the one of the display terminals to access the computer-implemented control center. The computer server also is configured to receive from the subscriber via the one of the display terminals a first change to the communication options and to update the first change to the account in the subscriber communication profile database.

There is further included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to one of the telephones when the subscriber employs the one of the telephones to access the computer-implemented control center. The telephony server also is configured to receive from the subscriber via the one of the telephones a second change to the communication options and to update the second change to the account in the subscriber communication profile database.

The invention relates, in another embodiment, to a computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services includes a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options are accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The method includes providing a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included visually displaying the communication options on one of the display terminals, using a

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computer server coupled to exchange data with the subscriber communication profile database, when the subscriber employs the one of the display terminals to access the computer-implemented control center. There is further included receiving from the subscriber via the one of the 5 display terminals at the computer server a first change to the communication options. The first change to the communication options pertains to either the voice telephone service or the e-mail service. Additionally, there is included updating the first change to the account in the subscriber com- 10 munication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to the subscriber at the unified messaging system, including the voice telephone service, are handled in accordance with the first updated subscriber 15 communication profile database.

These and other features of the present invention will be described in more detail below in the detailed description of the invention and in conjunction with the following figures.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

- FIG. 1 depicts, in one embodiment, the general overview of the unified message system.
- FIG. 2 illustrates, in one embodiment, how the 48 telephone lines provided per T1 link may be divided among the 30 sub-servers of the telephony server.
- FIG. 3, in one embodiment, the user interface portion of the computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer 35 display screen.
- FIG. 4 shows the communication options in greater detail, in accordance with one embodiment of the present invention
- FIG. 5 is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unified messaging system through the telephony-centric network by a subscribing or a non-subscribing caller.
- FIG. 6 is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system through a computer network by a subscriber.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described in detail with reference to a few referred embodiments thereof and as illustrated in the accompanying drawings. In the following 55 description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to one skilled in the art, that the present invention may be practiced without some or all of those specific details. In other instances, well known 60 process steps have not been described in detail in order not to unnecessarily obscure the present invention.

In accordance with one aspect of the present invention, there is provided a computer-implemented control center which is coupled to the data-centric network and the 65 telephony-centric network, and which allows a user to access, using either a telephone or a computer, the commu-

nication options associated with the various communication services of a unified messaging service. Unlike the prior art approach which requires the user to contact individual service providers/accounts and/or to access individual communication devices to review and change the communication options associated therewith, the computer-implemented control center allows the communication options associated with the various communication services to be accessed substantially all at once. That is, the computer-implemented control center provides a single central facility through which the communication option settings associated with the different communication services may be reviewed and/or modified.

In accordance with one aspect of the present invention, the communication options, which include the options associated with individual communication services as well as routings among the different individual communication services, are accessible using either a computer network interface (e.g., a web page) or a telephone network interface (e.g., via a telephone). The communication option settings themselves do not reside with individual communication devices or require access through a particular communication device (such as with the assigned facsimile machines or telephones discussed earlier). Rather, the communication option settings are centralized within the universally accessible computer-implemented control center and can be utilized to properly control the communication options associated with the various services and to facilitate control of the routings therebetween. More importantly, they can be reviewed and modified by a properly authenticated subscriber of the unified messaging service through any suitable computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

In the aforementioned co-pending patent applications entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA" (Scr. No. 09/239,560 filed Jan. 29, 1999), and "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITH A THIN WEB BROWSER (Ser No. 09/240,367, filed Jan. 29, 1999), which are all incorporated herein by reference, some inventive unified messaging services and their various features are disclosed. Although the present invention may be implemented on any unified messaging system, reference may be made to the above-mentioned co-pending patent applications for details pertaining to preferable unified messaging systems on which the present invention may be implemented.

In general terms, a unified messaging system benefits a user by integrating various communication services, which up to now have existed as separate services. The integration facilitates simplified management, billing, and more importantly the routing of messages among the various services. With a unified messaging service, a user may, for example, specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, or the like. Within limits, a unified messaging system allows messages to be received, stored, retrieved, and/or forwarded (in the original format or in a different/abbreviated format) without regard to the communication devices and/or networks (i.e., data-centric vs. telephony-centric) employed for the transmission of the messages.

A unified messaging system implemented on a datacentric network takes the unified messaging system concept

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a step further by internally storing and manipulating the messages in a digital format irrespective of whether the message was received and/or will be sent in the digital or analog format. As is well known, digital formating increases the flexibility with which information contained in the messages can be analyzed, stored, manipulated, and/or routed among the various communication devices. More importantly, the implementation of the unified messaging system on a data-centric network permits the subscriber to access his account through any computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

To facilitate discussion, FIG. 1 depicts, in accordance with one embodiment of the present invention, the general overview of a unified message system 101. With reference to FIG. 1, there is shown a user computer 100, representing a computer that may be employed to access and/or modify the communication options associated with the communication services offered by the unified messaging system. Although user computer 100 is shown to be a desktop personal computer (such as an Intel-based personal computer), user computer 100 may in fact represent any computing device capable of accessing the data-centric network (represented by reference 102 in FIG. 1). By way of example, user computer 100 may represent a laptop computer, which may access the data-centric network either through wired connections or in a wireless manner. As another example, user computer 100 may represent a personal digital assistant (PDA) or a palm-top computer, or a thin-client type computer.

Data-centric network 102 may represent any computer network which couples together users from geographically dispersed locations. In a preferred embodiment, data-centric network 102 represents the Internet, although data-centric network 102 may also represent a Wide Area Network (WAN), a Local Area Network (LAN), a Virtual Private Network (PN) or any similarly suitable networking arrangement that allows users to log in from a remote terminal.

With reference to FIG. 1, there is shown data link 104, representing the high speed data lines for transmitting and receiving data between unified messaging system 101 and data-centric network 102. In a preferred embodiment, data link 104 is implemented by high speed T1 data lines, although other types of data lines such as fiber optics may also be employed. A network interface system 105 couples data link 104 to the remainder of unified messaging system 101, which is shown to include four servers as shown (the servers are discussed later herein).

Network interface system 105 represents the interface system that ensures data is properly transmitted and received between unified messaging system 101 and data-centric network 102. Of course network interface system 105 may vary depending on the implementations of the data-centric network and/or the portion of unified messaging system 101 to which network interface system 105 is coupled.

In the case of the Internet, one current preferred implementation of network interface system 105 may include a router 106, a hub 108, a DNS (Domain Name System) facility 110, and a lirewall 112. Typically, the router 106 is a piece of hardware or software that examines the IP address of data packets and determines the routing of the data packets based on the IP address.

Router 106 acts cooperatively with hub 108 and DNS facility 110 to permit properly addressed data packets to be received through firewall 112. Router 106, hub 108, DNS 65 facility 110, and firewall 112 are conventional and will not be belabored here for the sake of brevity.

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At the heart of the unified message system are a set of servers which are coupled to exchange data and are connected to firewall 112 and the public telephone network. Typically, a server represents a computer that processes data for use by other data-consumer devices (such as other servers, computers or any of the communication devices through a proper interface circuit). There is shown a database server 120, which is employed to, among other tasks, organize and maintain the subscriber communication profile database. The subscriber communication profile database itself may reside with database server 120 and represents a data store of subscriber accounts and communication option settings associated therewith. Incoming messages to a particular subscriber or outgoing messages from that subscriber are formatted and routed in accordance with the communication option settings stored in the subscriber communication profile database. Properly authorized changes to the communication option settings will be reflected in the communication option settings stored in the subscriber communication profile database and employed to handle subsequent messages (whether incoming or outgoing).

Subscriber authentication data may be employed to access to a subscriber communication profile database. Subscriber authentication data may be stored in the database server. Subscriber authentication may be accomplished using several techniques. For example, a numeric password, an alphanumeric password, a hidden code wherein the password is randomly hidden in a string (i.e., xxxppppxxx, xppppxxxx, etc.) and biometrics (e.g., retina scans, hand prints, palm prints, finger prints, voice recognition, etc.).

A web server 122 is employed to facilitate interaction between unified messaging system 101 and data-centric network 102. Web server 122 represents one of the system-side servers (i.e., a server that handles the exchange of data with the user's computer via the data-centric network) and is employed, for example, to present to user computer 100 the log-in screen when a subscriber employs user computer 100 to access the unified messaging service. Once that subscriber is properly anthenticated (e.g., through a password procedure or another suitable authentication procedure), web server 122 then communicates with database server 120 to obtain the current communication option settings for that subscriber and to display the current communication option settings and an individualized web page to the subscriber for review.

In one preferred embodiment, web server 122 is employed to store all messages pertaining to a particular subscriber. The messages are stored as files in web server 122. These messages may represent, for example, voice files, facsimiles, e-mail messages, voice mail messages, or the like. Pointers in database server 120 facilitate access to the stored messages in web server 122. However, it is contemplated that the messages may be stored in any of the servers discussed herein and/or in a separate storage device accessible by the servers.

An e-mail server 124 is employed to process incoming and outgoing e-mail messages. By way of example, e-mail server 124 may be employed to format/translate the e-mail messages so that they can be properly transmitted to other e-mail systems and understood thereat. For incoming messages, e-mail server 124 may be employed to format/translate the information transmitted via the incoming e-mail and to prepare them for use by other data consumers.

A telephony server 126 is shown coupled between telephone link 128 and the remainder of the unified messaging system and may include any number of subservers, such as

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are shown in FIG. 2. In a manner analogous to web server 122, telephony server 126 represents a systemt-side server (i.e., a telephony server that handles the exchange of information with the user via the telephony-centric network) and is employed to facilitate interaction between unified messaging system 101 and telephony-centric network 129. Telephony server 126 may be employed to, for example, translate the telephone signals (such as the dialed digits) into a digital format for the purpose of authenticating and allowing subscriber access. Telephony server 126 may also be 10 employed to translate such dialed digits and/or other telephone signals (such as a facsimile tones or verbal commands) into digital data, which may then be employed to facilitate handling of messages and/or the communication option settings. In one embodiment, Dialogic board models 15 D 240 SC-T1, D 480 SC-1, CP-4/SC, CP-6/SC, and/or CP-12/SC (available from Dialogic Corporation of Parsippany, N.J.) are employed to facilitate the translation between telephone signals and digital data. Once translation is performed, software within telephony server 126 employs 20 the digital data to decide how to handle the message using the communication option settings obtained from the subscriber communication profile database. If the subscriber, through predefined dialing sequences, indicates that he wishes to review and/or modify the communication option 25 settings, software within telephony server 126 operates cooperatively with database server 120 to affect the change to the communication option settings. Once the communieation option settings are reflected in the subscriber communication profile database stored in database server 120, the new communication option settings are consulted each time a message needs to be handled by the unified messaging

Telephony-centric network 129 represents any telephone network which couples together telephony-type communi- 35 cation devices (e.g., facsimile machines, pagers, telephones) from geographically dispersed locations. By way of example, telephony-centric network 129 may represent a plain old telephone system (POTS), a wired telephone network popularly known as Public Service Telephone Network (PSTN) or a cellular network or a combination thereof. Telephony-centric network 129 is well known and will not be discussed in great detail here for the sake of brevity.

A telephone 130 is shown coupled to telephony-centric network 129. In reality, it should be understood that a wide 45 variety of telephony devices (which are not shown to simplify the illustration) are connected to telephony-centric network 129. Some of these exemplary communication devices are, as mentioned, facsimile machines, pagers, cellular telephone sets, wired telephone sets, and the like.

Telephone link 128 represents the telephone communication channels for transmitting and receiving telephone signals between unified messaging system 101 and telephonycentric network 129. In a preferred embodiment, telephone link 128 represents high bandwidth T1 telephone links, 55 although other types of telephone links may also be employed. Note that there is no requirement that the data transmitted on telephone link 128 be analog. In fact, with the upcoming convergence of data networks and telephone networks, the telephony information that traverses telephone '60 link 128 may well be digital (in which case, telephony server 116 will be adapted to handle digital telephony signals instead of analog telephony signals). As a noteworthy point, it is expected that as data networks and telephone networks converge, the relevant functionality represented by the serv- 65 ers herein may still apply, albeit with the proper modification to handle an all-digital combined data/telephone network.

FIG. 2 illustrates, in accordance with one embodiment of the present invention, how the 48 telephone lines provided per 'I'l link may be divided among the subservers of telephony server 126. As shown in FIG. 2, 45 of the telephone lines may be employed by a main message server 202 to handle the incoming/outgoing voice calls, the incoming voice mail messages, and the incoming facsimiles. Of the 45 telephone lines, 32 may be provisioned for the subscribing or non-subscribing users to dial into the unified messaging system, and the other 13 telephone lines may be employed. to allow outgoing calls to be made from within the unified messaging system. The outgoing calls may, for example, be calls destined for the unified messaging system but are rerouted out of the unified messaging system in accordance with a subscriber's communication option setting or they may be originated by the subscriber, who dials into the unified messaging system (using a toll-free access number, for example) and requests an outgoing call be made therefrom to some destination number (for example by punching in the "#" key after authentication, followed by the destination number), thus employing the unified messaging system as a type of calling card service.

One of the 48 telephone lines of the TI link may be reserved for outgoing facsimile transmission, which is handled by an outgoing facsimile server 204. Another telephone line may be apportioned for the outgoing paging service, which is handled by an outgoing pager server 206. Outgoing voice-mail messages are handled by voice mail server 208, which is coupled to another one of the 48 telephone lines of the Tt link as shown.

To elaborate, outgoing voicemails are voice messages sent to a voicemail phone number which may be created via the web or the telephone. Outgoing voicemails may be new voicemails, replies to other messages or forwarded as a voicemail. For example, when forwarding a voicemail via the web, the voicemail may be treated as an attachment to a speech synthesized text message with the recipient address as a telephone number. Outgoing voicemail servers may be geographically distributed and communicate with each other via internet in such a way that the server nearest the destination voicemail phone number may be assigned to send the voicemail via either a circuit-switched call or packet-switched call.

Outgoing facsimiles are facsimile messages sent to a facsimile telephone number which may be created via the web or the telephone. Outgoing facsimiles may be new facsimiles, replies to other messages, forwarded as a facsimile or call-forwarded as a facsimile in which the system stores the incoming facsimile and then forwards the facsimile to the subscriber's facsimile-forward number. For example, when forwarding a facsimile via the web, the facsimile may be treated as an attachment to Tiff conversion of a text message with the recipient address as a phone number. Like outgoing voicemail servers, outgoing facsimile servers may also be geographically distributed. Outgoing facsimile servers may communicate with each other via internet in such a way that the server nearest to the destination facsimile telephone number may be assigned to send the facsimile via either a circuit-switched call or packet-switched call.

Outgoing pages are paging messages sent to a pager number which may be created via the telephone either by the caller or by the system when sending notification. Like outgoing voicemail servers, outgoing page servers may also be geographically distributed. Outgoing page servers may communicate with each other via the internet in such a way that the server nearest to the destination pager telephone

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number may be assigned to send the page via either a circuit-switched call or packet-switched call.

There may also be outgoing emails and their servers that do not involve circuit switched calls. Some pagers may be alphanumerical type and can receive messages as an email. In this case, the outgoing pager server may delegate these requests to the outgoing email servers.

In one embodiment, messages sent to the unified messaging system may be stored in web server 122 with pointers to these messages being held in database server 120. The above mentioned set of sub-servers (outgoing facsimile server, outgoing pager server and outgoing voice mail server) are arranged to make requests to the database server for outgoing messages stored on the web server. If an outgoing message is detected by a sub-server, software within the 15 sub-servers decides how to handle the outgoing message according to the communication option settings obtained from the subscriber communication profile database. Again, a Dialogic board may be employed, in one embodiment, to facilitate the translation between the stored data and the 20 outgoing telephone signal.

All types of outgoing message requests (voicemail, facsimile, email, pages) are queued in the database server. These requests can also be associated with a delivery time (e.g., the default time is "now"). Each type of request may be stored in a separate queue. An outgoing server of a particular type of message periodically checks its queue from the database server to see if any request's time is up for delivery.

It should be noted that FIG. 2 shows only one exemplary way to divide the TI telephone lines among the various sub-servers of telephony server 126. Depending on the traffic pattern generated by subscribing and non-subscribing users of the unified messaging system, these lines and sub-servers may be scaled as necessary.

FIG. 3 illustrates, in accordance with one embodiment of the present invention, the user-interface for an exemplary computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer display screen. Through computer-implemented control center 302, the user may quickly and conveniently review the communication option settings associated with the various services and make changes thereto. That is, the computer-implemented control center 302 serves as the centralized control panel for reviewing and/or customizing the communication options associated with the various communication services. FIG. 4 illustrates aspects of computer-implemented control center 302 in greater detail.

In the exemplary implementation of FIG. 3, six representative communication options are shown. The call forwarding service 304, if it is enabled, allows incoming calls through telephony-centric network 129 to be routed to a provided forwarding number 306. The call forwarding option setting may also be seen in the detailed computer-implemented control center view of FIG. 4, which shows the communication options in greater detail.

To accomplish the forwarding, telephony server 126 consults, after a call is made to a subscriber's telephone on number, the subscriber communication profile database in database server 120. If the call forwarding option is enabled, that call is then forwarded to the forwarding number specified by telephony server 126 via an outgoing telephone line. If the forwarding number does not pick up, the call may be rerouted, for example, to the subscriber's voice mail box. If the call forwarding option is not enabled and the caller does

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not choose other methods discussed below to try to contact the subscriber, the call may then be forwarded to the subscriber's voice mail box as well.

The "follow me" service 308 gives the subscriber the ability to designate a set of telephone numbers where he may likely be found and gives the caller the option to try to find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. By way of example, during a work day, a given subscriber may be contacted either at his main office telephone, his secondary office telephone, or his cellular telephone in his car. On the weekend, that same subscriber may be found at home or at a cellular telephone in his boat. The office/car set of telephone numbers may be designated a primary set 310 and the home/boat set of telephone numbers may be designated a second set. FIG. 4 shows the communication options associated with the follow me service in greater detail.

On a week day, the subscriber may enable the follow me service option and select primary set 310 as the set of telephone numbers where he may likely be found. On the weekend, the subscriber may enable the follow me service option and select the secondary set, for example. From the caller's perspective, the follow me service is preferably an on-demand service. That is, the caller is prelerably given the option to decide whether to employ the follow me service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice mail if unanswered.

If the follow me service is enabled by the subscriber and chosen by the caller, telephony server 126 will try to place outgoing calls to the numbers designated in the selected set starting with the first number in the set. To ensure that the call is not inadvertently completed vis-a-vis by a bystander who happens to be near the destination telephone and picks up the telephone when it rings, telephony server 126 may allow the caller to record his name. Telephony server 126 then announces the name to the person picking up the destination telephone prior to giving that person a choice of whether to accept the call. If the person who picks up the call is indeed the person for whom the call is intended, the entry of a predefined key press (on instructions by telephony server 126) on the destination telephone keypad will allow telephony server 126 to complete the end-to-end connection. In this manner, the follow me service may be employed as a call screening mechanism if desired. Telephony server 126 may try all the numbers in the set in sequence until the subscriber is found. If not, the call may be allowed to pass into the subscriber's voice mail box.

In one embodiment, the follow-me service may not always use the same sequence to callout a subscriber when the subscriber has set up several numbers as his possible locations (e.g., weekday routine or weekend and evening routine). The follow-me service may use the number where the subscriber is last located (stored in memory) as the first number to dial in the sequence provided the time for the last location happened within a certain interval (e.g., an hour).

An alternate number service 312 gives the subscriber the ability to designate a telephone number as an alternate number where the caller can attempt to locate the subscriber (or someone who may appropriately handle the incoming call) at a number designated in advance (314). FIG. 4 shows the communication options associated with the alternate number service in greater detail. The alternate number option is similar to call forwarding with the exception that the alternate number option is an on-demand service. That is, the caller is preferably given the option to decide whether to

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employ the alternate number service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice-mail if unanswered. In all other respects, the alternate number service may function in the same way as the call forwarding service. An alternate number may also be used to set a personal operator number (e.g., your secretary).

Amessage alert option 316 gives the subscriber the ability to select whether to be alerted when a message is received. The message that triggers the alert may be specified using any number of filtering criteria stored as part of the subscriber communication option settings. In the example of FIG. 3, the filtering criteria is "urgent" (318) although any type of filtering may be applied. For example, the filtering criteria could be the message's sender, subject or content.

The sender could be identified by his small address or phone number (e.g., caller ID).

FIG. 4 shows, in one embodiment, the communication option settings associated with the unified messaging service in greater detail. With respect to the message alert service, 20 the alerting itself may be accomplished using any of the communication devices controlled by the unified messaging system (e.g., pager, lelephone at a designated number, voice mail in a designated voice mail box, faesimile at a designated facsimile number, e-mail at a designated e-mail 25 address, and the like). In accordance with one particularly advantageous embodiment, the message alert is sent to a pager via outgoing pager sub-server 206 since it is the device most likely to be near the subscriber. In one embodiment, the server that sends the alert (e.g., the web server if the 30 incoming message is an e-mail, the telephony server if the incoming message is a facsimile or telephone call) may send out a predefined alphanumeric code that identifies the type of incoming message. The alphanumeric code itself may be predefined either by the unified messaging system or by the 35 subscriber if customization is desired. Preferably, the alert is sent to the subscriber's own number to alert the subscriber that an incoming message fitting the filtering criteria has been received at the unified messaging system.

A facsimile receiving service 319 allows the user to 40 receive faesimile at the unified messaging system if someone sends a facsimile to the subscriber's telephone number. FIG. 4 shows the communication options associated with the facsimile receiving service in greater detail. If the facsimile receiving option is enabled, telephony server 126 will moni- 45 tor for the facsimile tone and process the incoming message as a facsimile if the facsimile tone is detected. In one embodiment, the incoming facsimile is stored as a GIF or TIFF file that may be viewed by the subscriber through a web page by clicking on facsimile mail link 320. If the 50 facsimile forward option 406 is also enabled, the facsimile will also be forwarded by the outgoing facsimile server 204 to another facsimile machine at specified facsimile number 408, additionally or alternatively to storing a copy of the received facsimile at the unified messaging service. If the 5 facsimile option is not enabled but the call forwarding option is enabled, the call is forwarded on and may be picked up by the forwarded device (if it is a functioning facsimile machine). If not, the incoming facsimile will not be

A paging service 321 allows a message sent to the subscriber to be rerouted to a pager designated by the subscriber. Paging service 321 is preferably an on-demand service and allows the caller, if desired, to send a short message to a pager designated by the subscriber. The pager of number designated by the subscriber may be designated at location 404a (the paging service number) and, if required,

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using location 404b (the PIN number for the pager). If the paging service is enabled, a caller to the subscriber's telephone number will be given an option to send a short message to the pager subscriber pager (for example, by pressing a predefined key to send the short message). As noted before, the caller may also choose any of the other services follow me service 308 and/or alternate number 312 if enabled. In this manner, a single telephone number may serve as the access point to receive a page, a voice message, a facsimile, etc.

For alphanomeric pagers with an email address, the outgoing page server may use text to describe the alert message (e.g., "you have a urgent voicemail from caller ID 41522222222 with return number 4153333333") instead of codes as in the case of numeric pagers. The outgoing pager server can then delegate the alert messages to the outgoing email server.

Voice mail messages that are stored may be listened to using either the computer (through an appropriate software/sound card) by clicking on voice mail link 330 (FIG. 3) or a telephone coupled to the telephony-centric network. E-mails that are sent to the subscriber using the subscriber's e-mail address may be read on-line by, for example, clicking on e-mail link 332 (FIG. 3). In one embodiment, telephone server 126 may be equipped with a text-to-speech facility to allow the subscriber to listen to the content of the e-mail message through a telephone. FIG. 3 also shows an outgoing c-mail link 334, which links the subscriber to an e-mail application program to allow the subscriber to compose and send out e-mail messages. In the case of replying an email via phone, a voice recording may be taken and sent as an email attachment.

As can be appreciated from the above examples, computer-implemented control center 302 provides a central visual interface that allows a subscriber to efficiently review and/or modify the communication option settings associated with the various communication services offered. This is in sharp contrast with time-consuming and burdensome prior art approaches whereby the person is required to contact different entities and deal with different accounts to change the communication options associated with different communication services.

In one embodiment, the computer-implemented control center has two views: the minimized view and the full view. In the minimized view (e.g., FIG. 3 in one embodiment), the computer-implemented control center may simply show the simplified routing details and the on-off settings associated with the communication options. Although the user may make changes to the on-off settings, fuller edit capabilities are preferably provided in the full view. In the full view (e.g., FIG. 4 in one embodiment), the computer-implemented control center additionally add explanations and detailed routing choices. If desired, an authentication procedure may be implemented with either the minimized view or the full view to ensure that the person making editing changes to the communication options is properly authorized.

It should be appreciated that the communication services and options discussed in connection with FIGS. 3 and 4 are only illustrative of the capabilities of the inventive computer-implemented control center, it should be apparent to chose skilled in the art that the same control panel may be presented to the subscriber through the telephony server and the telephone interface if the subscriber wishes to review and/or change the communication options using a telephone connected to the telephony-centric network. The communi-

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cation options may be presented in a sound format and the subscriber may be offered an option menu to review and/or change any communication option setting. Further, it should also be apparent to those skilled in the art that communication services options other than the preferred and discussed semmunication services and options can readily be controlled by the inventive computer-implemented control center. Irrespective of the services and options involved, a subscriber can access the centralized computer-implemented control center through either a computer connected to the data-centric network or a telephone connected to the telephony-centric network to review and/or change the communication options.

FIG. 5 is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for 15 handling access to the unified messaging system through the telephony-centric network by a subscribing or a nonsubscribing caller. The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages or e-mail messages, to use the unified 20 messaging system as a calling card service, or to review and/or modify the communication options. A nonsubscribing caller may access the unified messaging system to, for example, send a facsimile, a page, or to call the subscriber. The first step 502 involves accessing the unified 25 message system through a telephone using the subscriber's assigned telephone number. A set of two numbers may be assigned to a user, a local telephone number and a toll-free telephone number, both of which may be associated with a single user account.

The dialed digits reaches telephony server 126 via telephone link 128. Telephony server 126 then obtains the DNIS (direct number information service) by digitizing the dialed digits (step 504) and employs the dialed digits to obtain the communication option settings associated with the account represented by the dialed telephone number (step 506). As mentioned earlier, these communication option settings reside in the subscriber communication profile database, which may be managed by database server 120, in one embodiment. During this time, telephone server 126, through an appropriate interface board such as the aforementioned Dialogic board, monitors the incoming line for a facsimile tone or telephone key digit tone.

If no such facsimile tone or telephone key digit tone is detected (step 508), the call is assumed to be a normal call to the subscriber and will be handled (in steps 510 and 512) in accordance with the communication option settings in the manner discussed earlier (e.g., forwarded if call forwarding is on, routed to an alternate number if the caller selects that option and alternate service is enabled, and the like).

On the other hand, if a facsimile tone is detected by telephony server 126, the call will be handled as an incoming facsimile in accordance with the communication option settings (step 514). By way of example, if the facsimile receiving service is enabled, a copy of the facsimile will be stored for later retrieval by the subscriber. If the facsimile forwarding option is enabled, a copy of the facsimile is alternatively or additionally sent to the forwarded facsimile number.

On the other hand, if a keyed digit tone is detected by telephony server 126, software within telephony server will handle the options chosen by the caller (step 516). By way of example, one option may represent the subscriber wishing to access the computer-implemented control center (via an 65 appropriate key press) to review and/or change the communication options. In this case, telephony server 126 prefer-

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ably serves up the account statistics, e.g., how many voice mail messages, facsimiles, e-mail messages, etc. are waiting and asks the caller for authentication as a subscriber. If there are none, the subscriber may wish to quickly hang up and not go through the authentication procedure (and extending the cost of the call). This, however, is an option and may be eliminated if privacy is a concern (that is, authentication may take place before the presentation of account statistics).

Telephony server 126 may then obtain the authentication data from the caller (e.g., the password) and compare it with the subscriber account authentication data, which it obtains from the subscriber communication profile database in the database server. Authentication may be done via keyed digit entry or, in one embodiment, by voice commands, which may then be translated to keyed digits by appropriate software. If authenticated, the subscriber may then be presented with a menu that allows the subscriber to review and/or change the communication options via key press or voice commands. Once the subscriber saves the changes, the changed communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

As one of the options, the subscriber may be given a choice (with proper authentication) to use the unified messaging system to originate an outgoing call. The choice may be made via, for example, a predefined key press or voice command. This is useful in situations wherein the subscriber accesses his account at the unified messaging system through his toll-free number (e.g., from the airport or from someone else's telephone) and instructs the telephony server to connect his incoming call to an outgoing call to a provided destination telephone number and charges the cost to his account. In this manner, the unified messaging system may be employed as a convenient calling card.

A keyed digit may also represent an on-demand service selection chosen by the caller. In this case, the caller simply presses an appropriate key when prompted and employs one of the on-demand services is then employed to handle his call. Various on-demand services have been discussed in connection with FIGS. 3 and 4 and will not be repeated here for the sake of brevity.

FIG. 6 is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system by a subscriber through a data-centric network (such as the Internet in the example of FIG. 6). The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages, view stored e-mail messages or facsimiles, or to review and/or modify the communication options. The first step 602 involves accessing the unified messaging system web address (e.g., "unifiedmessagingsystem.com"), with user computer 100 through a data-centric network 102.

The web site request connects to the web server 122 via data link 104 and notwork interface system 105. Following connection to the web site, the unified messaging system web server 122 serves up a login page using, for example, ASP-active server pages (step 604). The next step (step 606) includes entering authentication data such as a subscriber identifier (ID), e.g., username and password, at the login page. The web server 122, after obtaining the authentication data, compares it with the subscriber account authentication data (step 608), which it obtains from the subscriber communication profile database from the database server. If

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authenticated, the subscriber may then be presented with a graphical menu of the communication options (step 610) that allows the subscriber to retrieve his email/voicemail/lax messages, or review and/or modify the communication options via user computer 100 (step 612). Once the subscriber saves the changes (step 614), the modified communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

Accordingly, the present invention provides a single centralized facility that gives a subscriber of various communication services (e.g., telephone, facsimile, pager, e-mail) the ability to review and modify his communication options (e.g., call forwarding, follow me service, alternate number, message alert, facsimile receiving, paging, routings and the like). This review and modification is done in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

The unified messaging system benefits a subscriber by integrating various communication services which up to now have existed as separate services. This is in sharp contrast to the prior art where the dual existence of the data-centric network and the telephony-centric network has forced the service providers to manage communication options as separate accounts.

This integration simplifies management, billing, and more importantly the routing of messages among the various services. The unified messaging system gives the subscriber more control with regards to how the world communicates to the subscriber. For example, a subscriber may specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, etc. The unified messaging system allows messages to be received, stored, retrieved, and/or forwarded without regard to the communication devices and/or networks employed for the transmission of the messages. In fact, the unified messaging system even gives non-subscribers choices with its on-demand services associated with some of the communication options.

The unified messaging system advantageously removes the burden of managing different physical devices and different accounts. The subscriber no longer has to access multiple accounts to modify options. As mentioned previously, a person who travels may wish to forward calls made from his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to an office facsimile machine to a facsimile machine that is more local. While in a meeting, however, one may wish to temporarily divert the voice calls to a voice mail box or forwards it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time one arrives at a new location.

Using the present invention, a person need only access the unified messaging system either with a telephone or a computer. The communication options may then be modified as needed with a few key strokes. The subscriber has the ability to review communication options at a single facility and no longer has to recall communication options from memory or contact each service provider.

Furthermore, the present invention advantageously allows remote access to the unified messaging system from any location that is connected to the data-centric network or the 65 telephony-centric network. The subscriber no longer has to be physically present at the forwarding origin to modify the

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forwarding option. This advantage leads to yet another advantage in that the unified messaging system may be used as a calling card. The subscriber if located at the airport, for example, contacts his unified messaging system toll-free telephone number. The system then allows the subscriber the option of rerouting this call to another location.

Also, the present invention advantageously allows the subscriber the convenience of one telephone number (or two, including a toll-free 800 number). Multiple number confusion is avoided by connecting multiple numbers through the one number of the unified messaging system.

While this invention has been described in terms of several preferred embodiments, there are alterations, permutations, and equivalents which fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore infended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

- 1. A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:
 - a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services;
 - a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computerimplemented control center through said data-centric network, said computer server also being configured to receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication profile database, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service; and
 - a telephony server coupled to exchange data with said communication profile database, said telephony server

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being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computerimplemented control center, said telephony server also being configured to receive from said subscriber via 5 said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

- 2. The computer-implemented control center of claim 1 further comprising:
 - a pager server coupled to exchange data with said communication profile database, wherein said communication services further include a pager alert service and wherein said communication options further include a pager alert option, said pager server being configured to fransmit, when said pager alert option is enabled, an alert to a pager through said telephony-centric network if an e-mail message is received by said subscriber through said data-centric network, said pager having a page number that is also specified as part of said pager 30 alert option.
- 3. The computer-implemented control center of claim 1 wherein said plurality of communication services include a call forwarding ice configured to permit said subscriber to specify whether a call received at a telephone number 25 associated with said account be forwarded to a forwarding telephone number, said communication options including a call forwarding enable option and said forwarding telephone
- The computer-implemented control center of claim 1 30 wherein said plurality of communication services include a follow me service, said communication options including a follow-me service enable option associated with said followme service and a set of telephone numbers, said follow-me service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers.
- 5. The computer-implemented control center of claim 4 wherein said follow me service is configured to ring in 40 sequence each one of telephones associated said set of telephone numbers until said call by said caller is accepted.
- 6. The computer-implemented control center of claim 5 wherein said follow-me service is configured to ring first a last-found telephone number, said last-found telephone 45 number representing a telephone number associated with a phone previously employed by said subscriber to answer an immediately preceding call to said subscriber.
- The computer-implemented control center of claim 1 wherein said plurality of communication services include an 50 alternate number service, said communication options including an alternate number service enable option associated with said alternate number service and an alternate telephone number, said alternate number service enable option, when enabled by said subscriber, permits a caller to 55 said subscriber at said unified messaging system to elect to forward a call by said caller to an alternate telephone associated with said alternate telephone number.
- 8. The computer implemented control center of claim 1 wherein the first communication option includes a first 60 routing option, and wherein the second communication option includes a second routing option.
- The computer implemented control center of claim 8 wherein either the lirst routing option or the second routing option includes a plurality of routings.
- 10. The computer implemented control center of claim 1 wherein the first communication service and the second

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communication service are selected from a call forwarding service, a follow me service, an alternate number service, a message alert service, a fax receiving service or a paging SETVICE

- 11. The computer implemented control center of claim 1 wherein said plurality of communication services comprise an e-mail service configured to permit said subscriber to receive and transmit e-mails through said data centric network, and a voice telephone service configured to permit said subscriber to receive and transmit voice calls through said telephony-centric network.
- 12. The computer-implemented control center of claim 11 wherein said plurality of communication services include a facsimile service configured to permit said subscriber to receive at said unified messaging system a facsimile through said telephony-centric network and said telephony server, said communication options including a facsimile receiving enable option associated with said facsimile service.
- 13. The computer-implemented control center as recited in claims 12 wherein said facsimile and said voice telephone service are both implemented using a single telephone number.
- 14. The computer-implemented control center of claim 1 further comprising a pager server coupled to exchange data with said communication profile database, wherein said communication services include a pager alert service, and wherein said communication options include a pager alert enable option associated with said pager alert service and a pager number, said pager alert option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a page by said caller to said pager number.
- 15. The computer-implemented control center of claim 1 wherein at least one of the communication service is an on-demand communication service, and wherein said communication options include an on-demand communication enable option associated with said on-demand communication service and a forwarding number, said on-demand communication enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call or message by said caller to said forwarding number.
- 16. A computer-implemented method for permitting a subscriber of a unified messaging system to customize communication options pertaining to a plurality of communication services associated with said unified messaging system through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said plurality of communication services comprising a voice telephone service and e-mail service, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said computer-implemented method comprising:
 - receiving, via either a first display terminal of said display terminals or a first telephone of said telephones, a request to access an account pertaining to said subscriber, said account including said communication options for said subscriber;
 - obtaining from a subscriber communication profile database said communication options for said subscriber in said account, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, wherein at least one of the communication services is an on-demand communication service, and wherein

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said communication options include an on-demand communication enable option and a forwarding number associated with said on-demand communication service, said on-demand communication enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call or message by said caller to said forwarding number:

presenting said communication options for said subscriber on respective one of said first display terminals 10 or through said first telephone from which said request to access is received, said communication options being visually presented in a single graphical menu arranged for displaying said communication options for each of the communication services at the same time on 15 said first display terminal via an individualized web page associated with said subscriber or audibly presented at said first telephone;

receiving communication setting edits from said subscriber through said respective one of said first display 20 terminal and said first telephone from which said request to access is received, said communication setting edits pertaining to said communication options;

modifying said communication options in accordance 25 with said communication setting edits, wherein said communication services are subsequently controlled in accordance with said communication options after said modifying.

17. The computer-implemented method of claim 16 30 wherein said plurality of communication services include a call forwarding service, said receiving said communication edits includes receiving at least one of a call forwarding enable option associated with said call forwarding service and a forwarding telephone number associated with said call 35 forwarding service, said call forwarding enable option, when enabled by said subscriber, forwards calls destined for said subscriber at said unified messaging system to said forwarding telephone number, and wherein said modifying said communication options includes modifying a setting associated with said forwarding service in accordance with said at least one of said call forwarding enable option and said forwarding telephone number.

18. The computer-implemented method of claim 16 wherein said plurality of communication services include a 45 unified messaging system to customize communication follow-me service, said receiving said communication edits includes receiving, as one of said communication setting edits, at least one of a follow-me service enable option associated with said follow-me service and a set of telephone numbers, said follow-me service enable option when 50 enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers, and wherein said modifying said communication options includes modifying a setting associated 55 with said follow-me service in accordance with said at least one of said follow-me service enable option and said set of telephone numbers.

19. A computer-implemented control center for permitting a subscriber of a plurality of communication services of a 60 unified messaging system to customize communication options pertaining to said plurality of communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:

a subscriber communication profile database, said subscriber communication profile database having therein 22

an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, wherein at least one of the communication services is an on-demand communication service, and wherein said communication options include an on-demand communication enable option and a forwarding number associated with said on-demand communication service, said on-demand communication enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call or message by said caller to said forwarding number;

- a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computerimplemented control center through said data-centric network, said computer server also being configured to receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication pro-
- a telephony server coupled to exchange data with said communication profile database, said telephony server being configured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computerimplemented control center, said telephony server also being configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile database.

A computer-implemented control center for permitting a subscriber of a plurality of communication services of a options pertaining to said plurality of communication services through either a telephony-centric network using a telephone or a data-centric network using a display terminal, said computer-implemented control center comprising:

- a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber, said communication options including parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services;
- a computer server coupled to exchange data with said subscriber communication profile database, said computer server being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time, and to visually display said single graphical menu on said display terminal when said subscriber employs said display terminal to access said computerimplemented control center through said data-centric network, said computer server also being configured to

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receive from said subscriber via said display terminal and said data-centric network a first change to said communication options and to update said first change to said account in said subscriber communication profile database, wherein said single graphical menu com- 5 prises at least a first display area for showing a first communication service, and a first communication option associated with said first communication service, and a second display area for showing a second communication service, and a second communication 10 option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication service and the second communication service are 15 selected from a call forwarding service, a follow me

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service, an alternate number service, a message alert service, a fax receiving service or a paging service,

a telephony server coupled to exchange data with said communication profile database, said telephony server being conligured to audibly represent said communication options to said telephone when said subscriber employs said telephone to access said computerimplemented control center, said telephony server also being configured to receive from said subscriber via said telephone a second change to said communication options and to update said second change to said account in said subscriber communication profile data-

EXHIBIT 2

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(12) United States Patent O'Neal et al.

(10) Patent No.:

US 6,728,357 B2

(45) Date of Patent:

Apr. 27, 2004

(54) CENTRALIZED COMMUNICATION CONTROL CENTER AND METHODS THEREFOR

(75) Inventors: Stephen C. O'Neal, San Francisco, CA (US); John Jiang, Danville, CA (US)

(73) Assignee: Microsoft Corporation, Redmond, WA

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 483 days.

(21) Appl. No.: 09/907,051

(22) Filed: Jul. 17, 2001

(65) Prior Publication Data

US 2002/0110231 At Aug. 15, 2002

Related U.S. Application Data

(63)	Continuation of application No. 09/239,585, filed on Jan. 29,
• •	1999, now Pat, No. 6,263,064.

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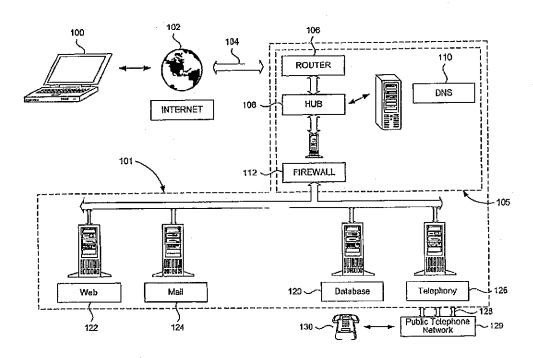
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Primary Examiner—Roland G. Foster (74) Attorney, Agent, or Firm—Senniger, Powers, Leavitt & Roedel

(57) ABSTRACT

A computer-implemented control center for permitting a subscriber of a plurality of communication services of a milied mess aging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprise a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options are accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network.

18 Claims, 6 Drawing Sheets



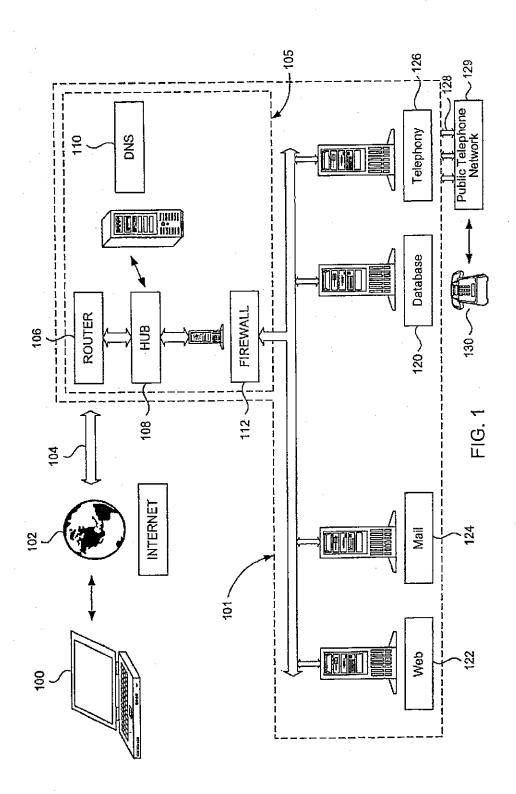
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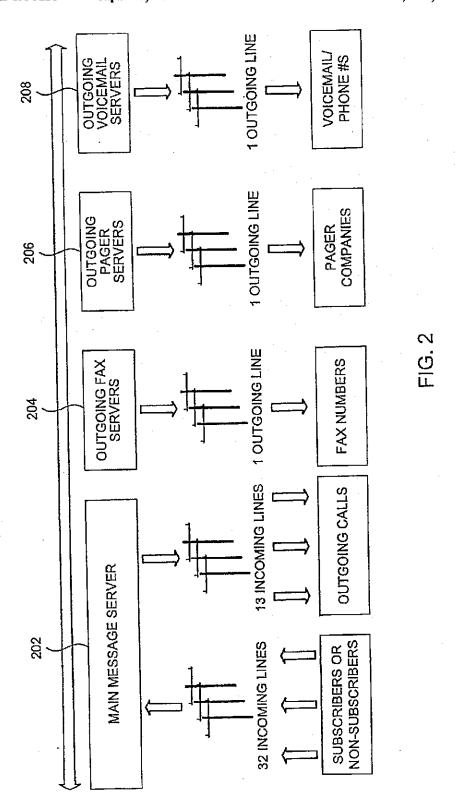


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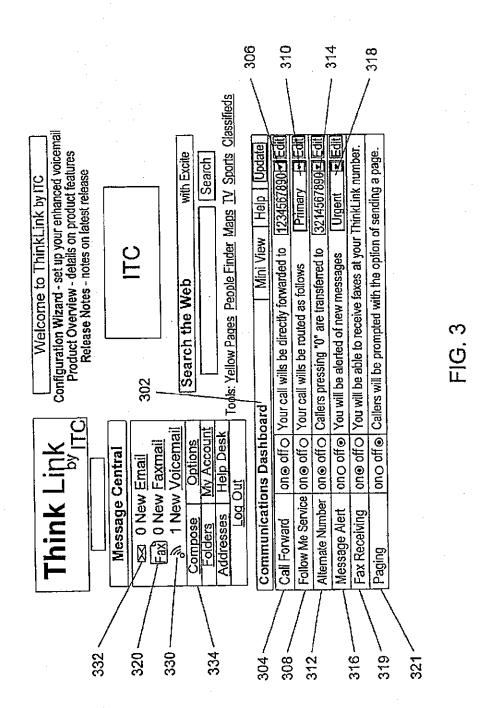
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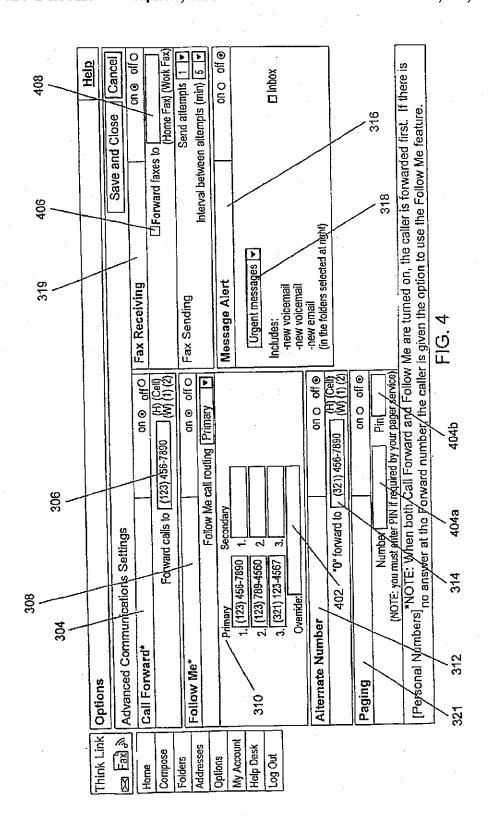
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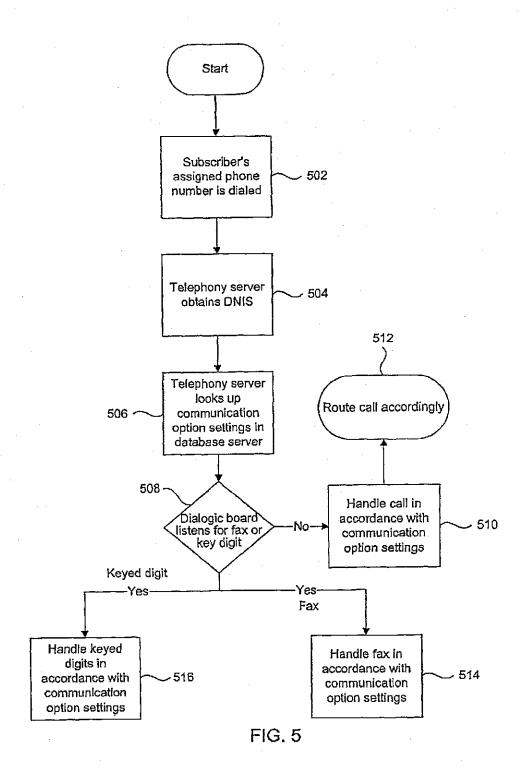
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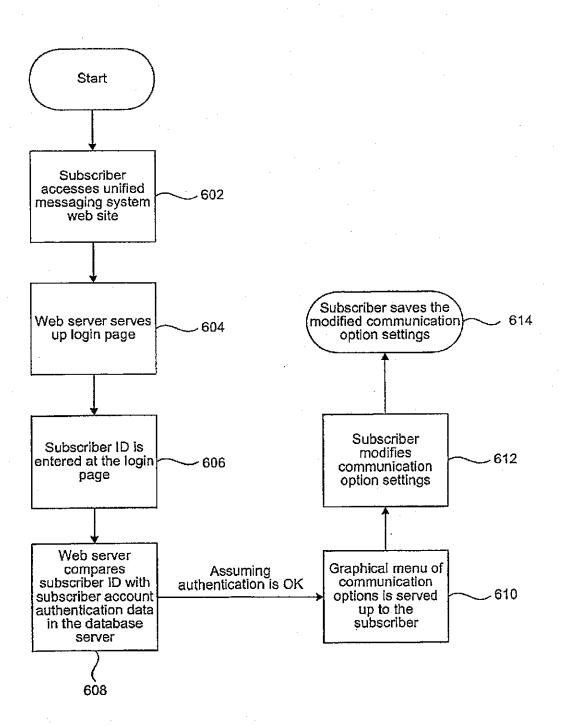


FIG. 6

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CENTRALIZED COMMUNICATION CONTROL CENTER AND METHODS THEREFOR

CROSS REFERENCE TO RELATED APPLICATIONS

The present application is a continuation of U.S. patent application Scr. No. 09/239,585, filed on Jan. 29, 1999, now U.S. Pat. No. 6,263,064.

application Scr. No. 09/239,560, filed Jan. 29, 1999, entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA";

U.S. Pat. No. 6,411,695, issued Jun. 25, 2003, entitled "A 15 SYSTEM AND METHOD FOR PROVIDING UNITED MESSAGING TO A USER WITH A THIN WEB BROWSER":

U.S. Pat. No. 6,463,145, issued Oct. 8, 2002, entitled "COMPUTER-IMPLEMENTED CALL FORWARDING 20 OPTIONS AND METHODS THEREFOR IN A UNIFIED MESSAGING SYSTEM";

application Ser. No. 09/240,893, filed Ian. 29, 1999, entitled "INTERACTIVE BILLING SYSTEM UTILIZING A THIN WEB CLIENT INTERFACE";

application Ser. No. 09/240,368, filed Jan. 29, 1999, entitled "A SYSTEM AND METHOD TO MANAGE PHONE SOURCED MESSAGES";

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application Scr. No. 09/240,435, filed Jan. 29, 1999, entitled "APPARATUS AND METHOD FOR DEVICE INDEPENDENT MESSAGING NOTHICATION";

application Ser. No. 09/240,436, filed Jan. 29, 1999, entitled "APPARATUS AND METHOD FOR CHANNEL-TRANSPARENT MULTIMEDIA BROADCAST MESSAGING":

application Scr. No. 09/239,589, filed Jan. 29, 1999, ⁴⁰ entitled "VOICE ACCESS THROUGH A DATA-CENTRIC NETWORK TO AN INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM".

BACKGROUND OF THE INVENTION

The present invention relates to communication services available via a data-centric network (i.e., a network that carries digital data) and a telephony-centric network (i.e., a network that carries telephony information such as voice, 50 fax, pager, and the like). More particularly, the present invention relates to a centralized facility and methods therefor that allow a subscriber of various communication services to review and customize his communication options, in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

Both the data-centric network (e.g., a distributed computer network) and the telephony-centric network (e.g., public telephone network) have existed for some time. Broadly speaking, the data-centric network (such as the filternet) may be thought of as a global computer network that connects millions of computer terminals all over the world in such a way that digitized information can be exchanged irrespective of the different hardware and software platforms that may be utilized to gain access to the 65 data-centric network. People and businesses around the world use the data-centric network to retrieve information,

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communicate and conduct business globally, and access a vast array of services and resources on-line. In a similar manner, the telephony-centric network (whether wired or wireless) may also be thought of as another global network that connects the millions of telephony devices (such as voice-oriented telephones, pagers, facsimile machines, voice mail boxes, and the like) together in such a way that a user at one of the telephony devices can readily transmit information to other telephony devices irrespective of geographic boundaries.

In the past, these two networks existed as separate domains. This is because the widely accessible data-centric network is a fairly recent phenomenon. For decades, the only network that has been available to the masses is the analog telephony-centric network, starting with the telegraph network of the nineteenth century. However, as more and more of the services traditionally offered through the telephony-centric network are being offered in a digital format by the data-centric network, the distinction between the data-centric network and the telephony-centric network begins to blur. Irrespective of whether these two networks exist as separate networks physically or conceptually going forward, the legacies of their separate existence can be seen in the various different communication services and communication devices that currently exist.

By way of example, there exist many different communication devices and services available today to allow a person to communicate to another person, e.g., telephones, facsimile machines, electronic mail (e-mail), pagers, voice mail, and the like. Generally speaking, a telephone is a communication device employed to transmit and receive speech and other sounds. A facsimile machine is a communication device to transmit and receive graphical data. A pager is a highly portable device that allows its user to receive data, and in some cases transmit limited data to a pager service provider. A voice mail box is essentially a service that allows one person to temporarily store telephone messages for retrieval by another. E-mail services allow e-mail users to transmit and receive data from computer terminals connected to the data-centric network. All these devices and services are well known in the art and will not be elaborated further for the sake of brevity.

Currently, these communication services are viewed, both by the service providers who create and maintain the network infrastructure and the subscribers who employ the devices and networks for communication, as separate services. This is due, partly but not entirely, to past government deregulation efforts and gradual technological evolution that have given rise to different service providers, all competing to provide the communication services to individual consumers. Thus, it is not unusual for a consumer to have an e-mail account with one service provider, a telephone account with another service provider and a pager account with yet another service provider. Even if the different services are contracted through a single service provider, the dual existence of the data-centric network and the telephony-centric network, as well as existing billing and account management infrastructures, often force the service provider to manage each of these services as a separate account.

One of the consequences of having different accounts for different services is the proliferation of telephone numbers, facsimile numbers, and pager numbers that a typical consumer must deal with. Thus, it is not at all unusual for a consumer to have a home telephone number, a work telephone number, one or more cellular telephone numbers, a pager number, and a facsimile number, with each of these

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numbers being assigned to a different communication device. Not only are these various numbers difficult to remember for the consumer, they are confusing to others.

A more serious consequence is the burden on the consumer who needs to manage the communication options associated with the different services (which are now assigned to different physical devices and managed as different accounts) to ensure that incoming and outgoing messages are properly handled. By way of example, a person who travels may wish to forward voice calls made to his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to his office facsimile machine to a facsimile machine that is more local. While in a meeting, however, he may wish to temporarily divert the voice calls to his voice mail box or forward it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time he arrives at a new location.

To accomplish the above, the person in the above example currently needs to first ascertain the current communication option settings associated with the various services that he uses. Unless he is diligent in noting and/or remembering the recent changes in the communication option settings, he may need to call each of the service providers to find out what the current communication option settings are. Assuming that he knows the current communication option settings and such calls need not be made, the user must still access each communication device and/or contact each service provider to reroute the incoming and outgoing messages.

By way of example, some facsimile machines currently allow the user to forward the incoming facsimile to another facsimile machine by entering a particular combination of the forwarding number and predefined codes on the facsimile machine keypad. Likewise, many telephone systems require the user to physically enter the forwarding telephone number and predefined codes on the keypad of the telephone from which forwarding originates. However, this requires the user to be physically present at the facsimile machine or telephone from which forwarding originates. If he owns one of these telephones or facsimile machines and is on the road, such forwarding would not be possible absent help from another person who has such physical access.

The fact that each communication service is treated as a different account also requires the user in the example above to access each account and/or service provider to accomplish the changes. Thus, multiple calls may need to be made to change the communication option settings associated with the different communication services. Even with automated response systems in place to handle such changes, these calls take time and can aggravate even the most patient users, especially if multiple calls need to be made to the multiple service providers each time he moves from one location to another. As can be appreciated by those skilled in the art, such approach is at best time consuming and unwieldy.

More typically, a busy user would just not bother changing the communication options associated with the various communication devices that he owns. He would rather suffer the possibility of missing out on some messages than constantly contacting the different service providers and somaking changes on individual services. In this case, the communication services that he owns are not employed to their fullest potential.

In view of the forgoing there are desired improved techniques for allowing a user of communication services to 65 review and customize the communication options associated with these services in a simplified and convenient manner.

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SUMMARY OF THE INVENTION

The invention relates, in one embodiment, to a computerimplemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options is accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The computerimplemented control center includes a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included a computer server coupled to exchange data with the subscriber communication profile database. The computer server is configured to visually display the communication options on one of the display terminals when the subscriber employs the one of the display terminals to access the computer-implemented control center. The computer server also is configured to receive from the subscriber via the one of the display terminals a first change to the communication options and to update the first change to the account in the subscriber communication profile database.

There is further included a telephony server coupled to exchange data with the communication profile database. The telephony server is configured to audibly represent the communication options to one of the telephones when the subscriber employs the one of the telephones to access the computer-implemented control center. The telephony server also is configured to receive from the subscriber via the one of the telephones a second change to the communication options and to update the second change to the account in the subscriber communication profile database.

The invention relates, in another embodiment, to a computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to the plurality of communication services. The communication options include parameters associated with individual ones of the plurality of the communication services and routings among the plurality of communication services. The plurality of communication services includes a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network. The communication options are accessible via display terminals coupled to the data-centric network and via telephones coupled to the telephony-centric network. The method includes providing a subscriber communication profile database. The subscriber communication profile database has therein an account pertaining to the subscriber. The account includes the communication options for the subscriber.

There is also included visually displaying the communication options on one of the display terminals, using a computer server coupled to exchange data with the subscriber communication profile database, when the subscriber employs the one of the display terminals to access the computer-implemented control center. There is further included receiving from the subscriber via the one of the

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display terminals at the computer server a first change to the communication options. The first change to the communication options pertains to either the voice telephone service or the e-mail service. Additionally, there is included updating the first change to the account in the subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to the subscriber at the unified messaging system, including the voice telephone service, are handled in accordance with the first updated subscriber 10 communication profile database.

These and other features of the present invention will be described in more detail below in the detailed description of the invention and in conjunction with the following figures.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

FIG. 1 depicts, in one embodiment, the general overview of the unified message system.

FIG. 2 illustrates, in one embodiment, how the 48 telephone lines provided per TI link may be divided among the 25 sub-servers of the telephony server.

FIG. 3, in one embodiment, the user interface portion of the computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer ³⁰ display screen.

FIG. 4 shows the communication options in greater detail, in accordance with one embodiment of the present invention.

FIG. 5 is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unitied messaging system through the telephony-centric network by a subscribing or a non-subscribing caller.

FIG. 6 is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system through a computer network by a subscriber.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described in detail with reference to a few preferred embodiments thereof and as illustrated in the accompanying drawings. In the following go description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to one skilled in the art, that the present invention may be practiced without some or all of these specific details. In other instances, well known process steps have not been described in detail in order not to unnecessarily obscure the present invention.

In accordance with one aspect of the present invention, there is provided a computer-implemented control center which is coupled to the data-centric network and the 60 telephony-centric network, and which allows a user to access, using either a telephone or a computer, the communication options associated with the various communication services of a unified messaging service. Unlike the prior art approach which requires the user to contact individual 65 service providers/accounts and/or to access individual communication devices to review and change the communica-

tion options associated therewith, the computerimplemented control center allows the communication options associated with the various communication services to be accessed substantially all at once. That is, the computer-implemented control center provides a single central facility through which the communication option settings associated with the different communication services

may be reviewed and/or modified. In accordance with one aspect of the present invention, the communication options, which include the options associated with individual communication services as well as routings among the different individual communication services, are accessible using either a computer network interface (e.g., a web page) or a telephone network interface (e.g., via a telephone). The communication option settings themselves do not reside with individual communication devices or require access through a particular communication device (such as with the assigned facsimile machines or telephones discussed earlier). Rather, the communication option settings are centralized within the universally accessible computer-implemented control center and can be utilized to properly control the communication options associated with the various services and to facilitate control of the routings therebetween. More importantly, they can be reviewed and modified by a properly authenticated subscriber of the unified messaging service through any suitable computer or telephone irrespective of the geographic location from which the accessing and/or modifications are

In the aforementioned co-pending patent applications entitled "INTEGRATED MESSAGE STORAGE AND RETRIEVAL SYSTEM DISTRIBUTED OVER A LARGE GEOGRAPHICAL AREA" (application Ser. No. 09/239, 560, filed Jan. 29, 1999), and "A SYSTEM AND METHOD FOR PROVIDING UNIFIED MESSAGING TO A USER WITHATHIN WEB BROWSER" (U.S. Pat. No. 6,411,685, issued Jun. 25, 2002), which are all incorporated herein by reference, some inventive unified messaging services and their various features are disclosed. Although the present invention may be implemented on any unified messaging system, reference may be made to the above-mentioned co-pending patent applications for details pertaining to preferable unified messaging systems on which the present invention may be implemented.

In general terms, a unified messaging system benefits a user by integrating various communication services, which up to now have existed as separate services. The integration facilitates simplified management, billing, and more importantly the routing of messages among the various services. With a unified messaging service, a user may, for example, specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, or the like. Within limits, a unified messaging system allows messages to be received, stored, retrieved, and/or forwarded (in the original format or in a different/abbreviated format) without regard to the communication devices and/or networks (i.e., data-centric vs. telephony-centric) employed for the transmission of the messages.

A unified messaging system implemented on a datacentric network takes the unified messaging system concept a step further by internally storing and manipulating the messages in a digital format irrespective of whether the message was received and/or will be sent in the digital or analog format. As is well known, digital formatting increases the flexibility with which information contained in

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the messages can be analyzed, stored, manipulated, and/or routed among the various communication devices. More importantly, the implementation of the unitled messaging system on a data-centric network permits the subscriber to access his account through any computer or telephone irrespective of the geographic location from which the accessing and/or modifications are made.

To facilitate discussion, FIG. 1 depicts, in accordance with one embodiment of the present invention, the general overview of a unified message system 101. With reference 10 to FIG. 1, there is shown a user computer 100, representing a computer that may be employed to access and/or modify the communication options associated with the communication services offered by the unified messaging system. Although user computer 100 is shown to be a desktop 15 personal computer (such as an Intel-based personalcomputer), user computer 100 may in fact represent any computing device capable of accessing the data-centric network (represented by reference 102 in FIG. 1). By way of example, user computer 100 may represent a laptop computer, which may access the data-centric network either through wired connections or in a wireless manner. As another example, user computer 100 may represent a personal digital assistant (PDA) or a palm-top computer, or a thin-client type computer.

Data-centric network 102 may represent any computer network which couples together users from geographically dispersed locations. In a preferred embodiment, data-centric network 102 represents the Internet, although data-centric network 102 may also represent a Wide Area Network (WAN), a Local Area Network (LAN), a Virtual Private Network (VPN) or any similarly suitable networking arrangement that allows users to log in from a remote terminal.

With reference to FIG. 1, there is shown data link 104, representing the high speed data lines for transmitting and receiving data between unified messaging system 101 and data-centric network 102. In a preferred embodiment, data link 104 is implemented by high speed 'l'1 data lines, although other types of data lines such as fiber optics may also be employed. A network interface system 105 couples data link 104 to the remainder of unified messaging system 101, which is shown to include four servers as shown (the servers are discussed later herein).

Network interface system 105 represents the interface system that ensures data is properly transmitted and received between unified messaging system 101 and data-centric network 102. Of course network interface system 105 may vary depending on the implementations of the data-centric network and/or the portion of unified messaging system 101 to which network interface system 105 is coupled.

In the case of the Internet, one current preferred implementation of network interface system 105 may include a router 106, a hub 108, a DNS (Domain Name System) 55 facility 110, and a firewall 112. Typically, the router 106 is a piece of hardware or software that examines the IP address of data packets and determines the routing of the data packets based on the IP address.

Router 106 acts cooperatively with hub 108 and DNS 61 facility 110 to permit properly addressed data packets to be received through firewall 112. Router 106, hub 108, DNS facility 110, and firewall 112 are conventional and will not be belabored here for the sake of brevity.

At the heart of the unified message system are a set of 65 servers which are coupled to exchange data and are connected to firewall 112 and the public telephone network.

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Typically, a server represents a computer that processes data for use by other data-consumer devices (such as other servers, computers or any of the communication devices through a proper interface circuit). There is shown a database server 120, which is employed to, among other tasks, organize and maintain the subscriber communication profile database. The subscriber communication profile database itself may reside with database server 120 and represents a data store of subscriber accounts and communication option settings associated therewith. Incoming messages to a particular subscriber or outgoing messages from that subscriber are formatted and routed in accordance with the communication option settings stored in the subscriber communication profile database. Properly authorized changes to the communication option settings will be reflected in the communication option settings stored in the subscriber communication profile database and employed to handle subsequent messages (whether incoming or outgoing).

Subscriber authentication data may be employed to access to a subscriber communication profile database. Subscriber authentication data may be stored in the database server. Subscriber authentication may be accomplished using several techniques. For example, a numeric password, an alphanumeric password, a hidden code wherein the password is randomly hidden in a string (i.e., xxxppppxx, xppppxxxx, etc.) and biometrics (e.g., retina scans, hand prints, palm prints, finger prints, voice recognition, etc.).

A web server 122 is employed to facilitate interaction between unified messaging system 101 and data-centric network 102. Web server 122 represents one of the system-side servers (i.e., a server that handles the exchange of data with the user's computer via the data-centric network) and is employed, for example, to present to user computer 100 the log-in screen when a subscriber employs user computer 100 to access the unified messaging service. Once that subscriber is properly authenticated (e.g., through a password procedure or another suitable authentication procedure), web server 122 then communicates with data-server 120 to obtain the current communication option settings for that subscriber and to display the current communication option settings and an individualized web page to the subscriber for review.

In one preferred embodiment, web server 122 is employed to store all messages pertaining to a particular subscriber. The messages are stored as files in web server 122. These messages may represent, for example, voice liles, facsimiles, e-mail messages, voice mail messages, or the like. Pointers in database server 120 facilitate access to the stored messages in web server 122. However, it is contemplated that the messages may be stored in any of the servers discussed herein and/or in a separate storage device accessible by the servers.

An e-mail server 124 is employed to process incoming and ontgoing e-mail messages. By way of example, e-mail server 124 may be employed to format/translate the e-mail messages so that they can be properly transmitted to other e-mail systems and understood thereat. For incoming messages, e-mail server 124 may be employed to format/translate the information transmitted via the incoming e-mail and to prepare them for use by other data consumers.

A telephony server 126 is shown coupled between telephone link 128 and the remainder of the unified messaging system and may include any number of sub-servers, such as are shown in FIG. 2. In a manuer analogous to web server 122, telephony server 126 represents a systemt-side server (i.e., a telephony server that handles the exchange of infor-

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mation with the user via the telephony-centric network) and is employed to facilitate interaction between unified messaging system 101 and telephony-centric network 129. Telephony server 126 may be employed to, for example, translate the telephone signals (such as the dialed digits) into a digital format for the purpose of authenticating and allowing subscriber access. Telephony server 126 may also be employed to translate such dialed digits and/or other telephone signals (such as a facsimile tones or verbal commands) into digital data, which may then be employed to facilitate handling of messages and/or the communication option settings. In one embodiment, Dialogic board models D 240 SC-T1, D 480 SC-1, CP-4 /SC, CP-6/SC, and/or CP-12/SC (available from Dialogic Corporation of Parsippany, N.J.) are employed to facilitate the translation between telephone signals and digital data. Once translation is performed, software within telephony server 126 employs the digital data to decide how to handle the message using the communication option settings obtained from the subscriber communication profile database. If the subscriber, through predefined dialing sequences, indicates that he wishes to review and/or modify the communication option settings, software within telephony server 126 operates cooperatively with database server 120 to affect the change to the communication option settings. Once the communication option settings are reflected in the subscriber communication profile database stored in database server 120, the new communication option settings are consulted each time a message needs to be handled by the unified messaging

Telephony-centric network 129 represents any telephone network which couples together telephony-type communication devices (e.g., facsimile machines, pagers, telephones) from geographically dispersed locations. By way of example, telephony-centric network 129 may represent a plain old telephone system (POTS), a wired telephone network popularly known as Public Service Telephone Network (PSTN) or a cellular network or a combination thereof. Telephony-centric network 129 is well known and will not be discussed in great detail here for the sake of brevity.

A telephone 130 is shown coupled to telephony-centric network 129. In reality, it should be understood that a wide variety of telephony devices (which are not shown to simplify the illustration) are connected to telephony-centric network 129. Some of these exemplary communication devices are, as mentioned, facsimile machines, pagers, cellular telephone sets, wired telephone sets, and the like.

Telephone link 128 represents the telephone communication channels for transmitting and receiving telephone signals between unified messaging system 101 and telephonycentric network 129. In a preferred embodiment, telephone link 128 represents high bandwidth T1 telephone links, although other types of telephone links may also be employed. Note that there is no requirement that the data transmitted on telephone link 128 be analog. In fact, with the 55 upcoming convergence of data networks and telephone networks, the telephony information that traverses telephone link 128 may well be digital (in which case, telephony server 116 will be adapted to handle digital telephony signals instead of analog telephony signals). As a noteworthy point, se it is expected that as data networks and telephone networks converge, the relevant functionality represented by the servers herein may still apply, albeit with the proper modification to handle an all-digital combined data/telephone network.

FIG. 2 illustrates, in accordance with one embodiment of the present invention, how the 48 telephone lines provided per 'l'1 link may be divided among the sub-servers of 10

telephony server 126. As shown in FIG. 2, 45 of the telephone lines may be employed by a main message server 202 to handle the incoming/outgoing voice calls, the incoming voice mail messages, and the incoming facsimiles. Of the 45 telephone lines, 32 may be provisioned for the subscribing or non-subscribing users to dial into the unified messaging system, and the other 13 telephone lines may be employed to allow outgoing calls to be made from within the unified messaging system. The outgoing calls may, for example, he calls destined for the unified messaging system but are rerouted out of the unified messaging system in accordance with a subscriber's communication option setting or they may be originated by the subscriber, who dials into the unified messaging system (using a toll-free access number, for example) and requests an outgoing call be made therefrom to some destination number (for example by punching in the "#" key after authentication, followed by the destination number), thus employing the unified messaging system as a type of calling card service.

One of the 48 telephone lines of the T1 link may be reserved for outgoing facsimile transmission, which is handled by an outgoing facsimile server 204. Another telephone line may be apportioned for the outgoing paging service, which is handled by an outgoing pager server 206. Outgoing voice-mail messages are handled by voice mail server 208, which is coupled to another one of the 48 telephone lines of the T1 link as shown.

To elaborate, outgoing voicemails are voice messages sent to a voicemail phone number which may be created via the web or the telephone. Outgoing voicemails may be new voicemails, replies to other messages or forwarded as a voicemail. For example, when forwarding a voicemail via the web, the voicemail may be treated as a attachment to a speech synthesized text message with the recipient address as a telephone number. Outgoing voicemail servers may be geographically distributed and communicate with each other via internet in such a way that the server nearest the destination voicemail phone number may be assigned to send the voicemail via either a circuit-switched call or packet-switched call.

Outgoing facsimiles are facsimile messages sent to a facsimile telephone number which may be created via the web or the telephone. Outgoing facsimiles may be new facsimiles, replies to other messages, forwarded as a facsimile or call-forwarded as a facsimile in which the system stores the incoming facsimile and then forwards the facsimile to the subscriber's facsimile-forward number. For example, when forwarding a facsimile via the web, the facsimile may be treated as an attachment to Tiff conversion of a text message with the recipient address as a phone number. Like outgoing voicemail servers, outgoing facsimile servers may also be geographically distributed. Outgoing facsimile servers may communicate with each other via internet in such a way that the server nearest to the destination facsimile telephone number may be assigned to send the facsimile via either a circuit-switched call or packet-switched call.

Outgoing pages are paging messages sent to a pager number which may be created via the telephone either by the caller or by the system when sending notification. Like outgoing voicemail servers, outgoing page servers may also be geographically distributed. Outgoing page servers may communicate with each other via the internet in such a way that the server nearest to the destination pager telephone number may be assigned to send the page via either a circuit-switched call or packet-switched call.

There may also be outgoing emails and their servers that do not involve circuit switched calls. Some pagers may be

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alphanumerical type and can receive messages as an email. In this case, the outgoing pager server may delegate these requests to the outgoing email servers.

In one embodiment, messages sent to the unified messaging system may be stored in web server 122 with pointers to these messages being held in database server 120. The above mentioned set of sub-servers (outgoing facsimile server) are outgoing pager server and outgoing voice mail server) are arranged to make requests to the database server for outgoing messages stored on the web server. If an outgoing message is detected by a sub-server, software within the sub-servers decides how to handle the outgoing message according to the communication option settings obtained from the subscriber communication profile database. Again, a Dialogic board may be employed, in one embodiment, to facilitate the translation between the stored data and the outgoing telephone signal.

All types of outgoing message requests (voicemail, facsimile, email, pages) are queued in the database server. These requests can also be associated with a delivery time (e.g., the default time is 'now'). Each type of request may be stored in a separate queue. An outgoing server of a particular type of message periodically checks its queue from the database server to see if any request's time is up for delivery.

It should be noted that FIG. 2 shows only one exemplary way to divide the T1 telephone lines among the various sub-servers of telephony server 126. Depending on the traffic pattern generated by subscribing and non-subscribing users of the unified messaging system, these lines and sub-servers may be scaled as necessary.

FIG. 3 illustrates, in accordance with one embodiment of the present invention, the user-interface for an exemplary computer-implemented control center, representing the visual display panel for displaying the communication options pertaining to a particular subscriber on a computer-display screen. Through computer-implemented control center 302, the user may quickly and conveniently review the communication option settings associated with the various services and make changes thereto. That is, the computer-implemented control center 302 serves as the contralized control panel for reviewing and/or customizing the communication options associated with the various communication services. FIG. 4 illustrates aspects of computer-implemented control center 302 in greater detail.

In the exemplary implementation of FIG. 3, six representative communication options are shown. The call forwarding service 304, if it is enabled, allows incoming calls through telephony-centric network 129 to be routed to a provided forwarding number 306. The call forwarding option setting may also be seen in the detailed computer-implemented control center view of FIG. 4, which shows the communication options in greater detail.

To accomplish the forwarding, telephony server 126 consults, after a call is made to a subscriber's telephone number, the subscriber communication profile database in database server 120. If the call forwarding option is enabled, that call is then forwarded to the forwarding number specified by telephony server 126 via an outgoing telephone line. If the forwarding number does not pick up, the call may be arreported, for example, to the subscriber's voice mail box. If the call forwarding option is not enabled and the caller does not choose other methods discussed below to try to contact the subscriber, the call may then be forwarded to the subscriber's voice mail box as well.

The "follow me" service 308 gives the subscriber the ability to designate a set of telephone numbers where he may

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likely be found and gives the caller the option to try to find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. By way of example, during a work day, a given subscriber may be contacted either at his main office telephone, his secondary office telephone, or his cellular telephone in his car. On the weekend, that same subscriber may be found at home or at a cellular telephone in his boat. The office/car set of telephone numbers may be designated a primary set 310 and the home/boat set of telephone numbers may be designated a second set. FIG. 4 shows the communication options associated with the follow me service in greater detail.

On a week day, the subscriber may enable the follow me service option and select primary set 310 as the set of telephone numbers where he may likely be found. On the weekend, the subscriber may enable the follow me service option and select the secondary set, for example. From the ealler's perspective, the follow me service is preferably an on-demand service. That is, the caller is preferably given the option to decide whether to employ the follow me service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice mail if unanswered.

If the follow me service is enabled by the subscriber and chosen by the caller, telephony server 126 will try to place outgoing calls to the numbers designated in the selected set starting with the first number in the set. To ensure that the call is not inadvertently completed vis-a-vis by a bystander who happens to be near the destination telephone and picks up the telephone when it rings, telephony server 126 may allow the caller to record his name. Telephony server 126 then announces the name to the person picking up the destination telephone prior to giving that person a choice of whether to accept the call. If the person who picks up the call is indeed the person for whom the call is intended, the entry of a predefined key press (on instructions by telephony server 126) on the destination telephone keypad will allow telephony server 126 to complete the end-to-end connection. In this manner, the follow me service may be employed as a call screening mechanism if desired. Telephony server 126 may try all the numbers in the set in sequence until the subscriber is found. If not, the call may be allowed to pass into the subscriber's voice mail box.

In one embodiment, the follow-me service may not always use the same sequence to callout a subscriber when the subscriber has set up several numbers as his possible locations (e.g., weekday routine or weekend and evening routine). The follow-me service may use the number where the subscriber is last located (stored in memory) as the first number to dial in the sequence provided the time for the last location happened within a certain interval (e.g., an hour).

An alternate number service 312 gives the subscriber the ability to designate a telephone number as an alternate number where the caller can attempt to locate the subscriber (or someone who may appropriately handle the incoming call) at a number designated in advance (314). FIG. 4 shows the communication options associated with the alternate number service in greater detail. The alternate number option is similar to call forwarding with the exception that the alternate number option is an on-demand service. That is, the caller is preferably given the option to decide whether to employ the alternate number service by pressing a predefined key in response to instructions or to simply allow the call to be passed to voice-mail if unanswered. In all other respects, the alternate number service may function in the same way as the call forwarding service. An alternate number may also be used to set a personal operator number (e.g., your secretary).

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A message alent option 316 gives the subscriber the ability to select whether to be alerted when a message is received. The message that triggers the alert may be specified using any number of filtering criteria stored as part of the subscriber communication option settings. In the example of FIG. 3, the filtering criteria is "urgent" (318) although any type of filtering may be applied. For example, the filtering criteria could be the message's sender, subject or content. The sender could be identified by his email address or phone number (e.g., caller ID).

FIG. 4 shows, in one embodiment, the communication option settings associated with the unified messaging service in greater detail. With respect to the message alert service, the alerting itself may be accomplished using any of the communication devices controlled by the unified messaging 15 system (e.g., pager, telephone at a designated number, voice mail in a designated voice mail box, facsimile at a designated facsimile number, e-mail at a designated e-mail address, and the like). In accordance with one particularly advantageous embodiment, the message alert is sent to a pager via outgoing pager sub-server 206 since it is the device most likely to be near the subscriber. In one embodiment, the server that sends the alert (e.g., the web server if the incoming message is an e-mail, the telephony server if the incoming message is a facsimile or telephone call) may send 25 out a predefined alphanumeric code that identifies the type of incoming message. The alphanumeric code itself may be predefined either by the unified messaging system or by the subscriber if customization is desired. Preferably, the alert is sent to the subscriber's own number to alert the subscriber 30 that an incoming message fitting the filtering criteria has been received at the unified messaging system.

A facsimile receiving service 319 allows the user to receive facsimile at the unified messaging system if someone sends a facsimile to the subscriber's telephone number. 35 FIG. 4 shows the communication options associated with the facsimile receiving service in greater detail. If the facsimile receiving option is enabled, telephony server 126 will monitor for the facsimile tone and process the incoming message as a facsimile if the facsimile tone is detected. In one 40 embodiment, the incoming facsimile is stored as a GIF or TIFF file that may be viewed by the subscriber through a web page by clicking on facsimile mail link 320. If the facsimile forward option 406 is also enabled, the facsimile will also be forwarded by the outgoing facsimile server 204 45 to another facsimile machine at specified facsimile number 408, additionally or alternatively to storing a copy of the received facsimile at the unified messaging service. If the facsimile option is not enabled but the call forwarding option is enabled, the call is forwarded on and may be picked 50 up by the forwarded device (if it is a functioning facsimile machine). If not, the incoming facsimile will not be

A paging service 321 allows a message sent to the subscriber to be rerouted to a pager designated by the stabscriber. Paging service 321 is preferably an on-demand service and allows the caller, if desired, to send a short message to a pager designated by the subscriber. The pager number designated by the subscriber may be designated at location 404a (the paging service number) and, if required, using location 404b (the PIN number for the pager). If the paging service is enabled, a caller to the subscriber's telephone number will be given an option to send a short message to the pager subscriber pager (for example, by pressing a predefined key to send the short message). As 65 noted before, the caller may also choose any of the other services follow me service 308 and/or alternate number 312

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if enabled. In this manner, a single telephone number may serve as the access point to receive a page, a voice message, a facsimile, etc.

For alphanumenc pagers with an email address, the outgoing page server may use text to describe the afert message (e.g., "you have a urgent voicemail from caller ID 4152222222 with return number 4153333333") instead of codes as in the case of numeric pagers. The outgoing pager server can then delegate the alert messages to the outgoing 10 email server.

Voice mail messages that are stored may be listened to using either the computer (through an appropriate software/sound card) by clicking on voice mail link 330 (FIG. 3) or a telephone coupled to the telephony-centric network. E-mails that are sent to the subscriber using the subscriber's e-mail address may be read on-line by, for example, clicking on e-mail link 332 (FIG. 3). In one embodiment, telephone server 126 may be equipped with a text-to-speech facility to allow the subscriber to listen to the content of the e-mail message through a telephone. FIG. 3 also shows an outgoing e-mail link 334, which links the subscriber to an e-mail application program to allow the subscriber to compose and send out e-mail messages. In the case of replying an email via phone, a voice recording may be taken and sent as an email attachment.

As can be appreciated from the above examples, computer-implemented control center 302 provides a central visual interface that allows a subscriber to efficiently review and/or modify the communication option settings associated with the various communication services offered. This is in sharp contrast with time-consuming and burdensome prior art approaches whereby the person is required to contact different entities and deal with different accounts to change the communication options associated with different communication services.

In one embodiment, the computer-implemented control center has two views:

the minimized view and the full view. In the minimized view (e.g., FIG. 3 in one embodiment), the computer-implemented control center may simply show the simplified routing details and the on-off settings associated with the communication options. Although the user may make changes to the on-off settings, fuller edit capabilities are pre-crably provided in the full view. In the full view (e.g., FIG. 4 in one embodiment), the computer-implemented control center additionally add explanations and detailed routing choices. If desired, an authentication procedure may be implemented with either the minimized view or the full view to ensure that the person making editing changes to the communication options is properly authorized.

It should be appreciated that the communication services and options discussed in connection with FIGS, 3 and 4 are only illustrative of the capabilities of the inventive computer-implemented control center. It should be apparent to those skilled in the art that the same control panel may be presented to the subscriber through the telephony server and the telephone interface if the subscriber wishes to review and/or change the communication options using a telephone connected to the telephony-centric network. The communication options may be presented in a sound format and the subscriber may be offered an option menu to review and/or change any communication option setting. Further, it should also be apparent to those skilled in the art that communication services options other than the preferred and discussed communication services and options can readily be controlled by the inventive computer-implemented control cen-

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ter. Irrespective of the services and options involved, a subscriber can access the centralized computer-implemented control center through either a computer connected to the data-centric network or a telephone connected to the telephony-centric network to review and/or change the communication options.

FIG. 5 is a flow diagram depicting, in one embodiment, the relevant steps of a computer-implemented process for handling access to the unified messaging system through the telephony-centric network by a subscribing or a nonsubscribing caller. The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages or e-mail messages, to use the unified messaging system as a calling card service, or to review and/or modify the communication options. A nonsubscribing caller may access the unified messaging system to, for example, send a facsimile, a page, or to call the subscriber. The first step 502 involves accessing the unified message system through a telephone using the subscriber's assigned telephone number. A set of two numbers may be assigned to a user, a local telephone number and a toll-free telephone number, both of which may be associated with a single user account.

The dialed digits reaches telephony server 126 via telephone link 128. Telephony server 126 then obtains the DNIS (direct number information service) by digitizing the dialed digits (step 504) and employs the dialed digits to obtain the communication option settings associated with the account represented by the dialed telephone number (step 506). As mentioned earlier, these communication option settings reside in the subscriber communication profile database, which may be managed by database server 120, in one embodiment. During this time, telephone server 126, through an appropriate interface board such as the aforementioned Dialogic board, monitors the incoming line for a facsimile tone or telephone key digit tone.

If no such facsimile tone or telephone key digit tone is detected (step 508), the call is assumed to be a normal call to the subscriber and will be handled (in steps 510 and 512) in accordance with the communication option settings in the manner discussed earlier (e.g., forwarded if call forwarding is on, routed to an alternate number if the caller selects that option and alternate service is enabled, and the like).

On the other hand, if a facsimile tone is detected by telephony server 126, the call will be handled as an incoming facsimile in accordance with the communication option settings (step 514). By way of example, if the facsimile receiving service is enabled, a copy of the facsimile will be stored for later retrieval by the subscriber. If the facsimile forwarding option is enabled, a copy of the facsimile is alternatively or additionally sent to the forwarded facsimile number.

On the other hand, if a keyed digit tone is detected by telephony server 126, software within telephony server will handle the options chosen by the caller (step 516). By way of example, one option may represent the subscriber wishing to access the computer-implemented control center (via an appropriate key press) to review and/or chance the communication options. In this case, telephony server 126 preferably serves up the account statistics, e.g., how many voice mail messages, facsimiles, e-mail messages, etc. are waiting and asks the caller for authentication as a subscriber. If there are none, the subscriber may wish to quickly hang up and not go through the authentication procedure (and extending the cost of the call). This, however, is an option and may be 65 eliminated if privacy is a concern (that is, authentication may take place before the presentation of account statistics).

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Telephony server 126 may then obtain the authentication data from the caller (e.g., the password) and compare it with the subscriber account authentication data, which it obtains from the subscriber communication profile database in the database server. Authentication may be done via keyed digit entry or, in one embodiment, by voice commands, which may then be translated to keyed digits by appropriate software. If authenticated, the subscriber may then be presented with a menu that allows the subscriber to review and/or change the communication options via key press or voice commands. Once the subscriber saves the changes, the changed communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

As one of the options, the subscriber may be given a choice (with proper authentication) to use the unified messaging system to originate an outgoing call. The choice may be made via, for example, a predefined key press or voice command. This is useful in situations wherein the subscriber accesses his account at the unified messaging system through his toll-free number (e.g., from the airport or from someone else's telephone) and instructs the telephone server to connect his incoming call to an outgoing call to a provided destination telephone number and charges the cost to his account. In this manner, the unified messaging system may be employed as a convenient calling card.

A keyed digit may also represent an on-demand service selection chosen by the caller. In this case, the caller simply presses an appropriate key when prompted and employs one of the on-demand services is then employed to handle his call. Various on-demand services have been discussed in connection with FIGS. 3 and 4 and will not be repeated here for the sake of brevity.

FIG. 6 is a flow diagram depicting, in one embodiment, the relevant steps of a computer implemented process for handling access to the unified messaging system by a subscriber through a data-centric network (such as the Internet in the example of PIG. 6). The subscriber may wish to access the unified messaging system to, for example, listen to stored voice mail messages, view stored c-mail messages or facsimiles, or to review and/or modify the communication options. The first step 602 involves accessing the unified messaging system web site, using a unified messaging system web address (e.g., "unifiedmessagingsystem.com"), with user computer 100 through a data-centric network 102.

The web site request connects to the web server 122 via data link 104 and network interface system 105. Following connection to the web site, the unified messaging system web server 122 serves up a login page using, for example, ASP-active server pages (step 604). The next step (step 606) includes entering authentication data such as a subscriber identifier (ID), e.g., username and password, at the login page. The web server 122, after obtaining the authentication data, compares it with the subscriber account authentication data (step 608), which it obtains from the subscriber communication profile database from the database server. If authenticated, the subscriber may then be presented with a graphical menu of the communication options (step 610) that allows the subscriber to retrieve his email/voicemail/fax messages, or review and/or modify the communication options via user computer 100 (step 612). Once the subscriber saves the changes (step 614), the modified communication option settings will be employed to handle future messages transmitted and/or received through either the telephony-centric network or the data-centric network.

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Accordingly, the present invention provides a single centralized facility that gives a subscriber of various communication services (e.g., telephone, facsimile, pager, e-mail) the ability to review and modify his communication options (e.g., call forwarding, follow me service, alternate number, message alert, facsimile receiving, paging, routings and the like). This review and modification is done in an interactive and simplified manner, via either the data-centric network or the telephony-centric network.

The unified messaging system benefits a subscriber by ¹⁰ integrating various communication services which up to now have existed as separate services. This is in sharp contrast to the prior art where the dual existence of the data-centric network and the telephony-centric network has forced the service providers to manage communication ¹⁵ options as separate accounts.

This integration simplifies management, billing, and more importantly the routing of messages among the various services. The unified messaging system gives the subscriber more control with regards to how the world communicates to the subscriber. For example, a subscriber may specify that an incoming facsimile be forwarded to a computer for viewing or to a printer for printing, listen to e-mail messages through a telephone, receive pager notification when a facsimile is received, etc. The unified messaging system allows messages to be received, stored, retrieved, and/or forwarded without regard to the communication devices and/or networks employed for the transmission of the messages. In fact, the unified messaging system even gives non-subscribers choices with its on-demand services associated with some of the communication options.

The unified messaging system advantageously removes the burden of managing different physical devices and different accounts. The subscriber no longer has to access multiple accounts to modify options. As mentioned previously, a person who travels may wish to forward calls made from his home and office telephone numbers to his cellular telephone or hotel telephone. Likewise, he may wish to divert facsimiles sent to an office facsimile machine to a facsimile machine that is more local. While in a meeting, however, one may wish to temporarily divert the voice calls to a voice mail box or forwards it to another person for handling. To stay in touch, these communication options may need to be changed many times during the course of the day and/or each time one arrives at a new location.

Using the present invention, a person need only access the unified messaging system either with a telephone or a computer. The communication options may then be modified as needed with a lew key strokes. The subscriber has the solility to review communication options at a single facility and no longer has to recall communication options from memory or contact each service provider.

Furthermore, the present invention advantageously allows remote access to the unified messaging system from any location that is connected to the data-centric network or the telephony-centric network. The subscriber no longer has to be physically present at the forwarding origin to modify the forwarding option. This advantage leads to yet another advantage in that the unified messaging system may be used as a calling eard. The subscriber if located at the airport, for example, contacts his unified messaging system toll-free telephone number. The system then allows the subscriber the option of rerouting this call to another location.

Also, the present invention advantageously allows the 65 subscriber the convenience of one telephone number (or two, including a toll-free S00 number). Multiple number

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confusion is avoided by connecting multiple numbers through the one number of the unified messaging system.

While this invention has been described in terms of several preferred embodiments, there are alterations, permutations, and equivalents which fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. A computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said method comprising:

providing a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber;

generating a single graphical menu for displaying said communication options for each of said communication services at the same time, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option included a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service;

visually displaying said single graphical menu on one of said display terminals, using a computer server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computerimplemented control center;

providing a telephony server coupled to exchange data with said communication profile database;

audibly representing said communication options to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to access said computer-implemented control center;

receiving from said subscriber via said one of said display terminals at said computer server a first change to at least one of said communication options, said first change to said communication options pertains to either said voice telephone service or said e-mail service; and updating said first change to said account in said sub-

scriber communication profile database, thereby result-

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ing in a first updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

2. The computer-implemented method of claim 1 further comprising:

receiving at said telephony server from said subscriber via said one of said telephones a second change to at least one of said communication options; and

updating said second change to said account in said subscriber communication profile database, thereby resulting in a second updated subscriber communication profile database, wherein subscriber messages to said subscriber at said unified messaging system, including said e-mail service are handled in accordance with said updated subscriber communication profile database.

3. The computer-implemented method of claim 2 wherein 20 said facsimile and said voice telephone service are both implemented using a single telephone number.

- 4. The computer-implemented method of claim 1 wherein said plurality of communication set-vices include a facsimile service configured to permit said subscriber to receive at 25 said unified messaging system a facsimile through said telephony-centric network and said telephony server, said communication options including a facsimile receiving enable option associated with said facsimile service.
- 5. The computer-implemented method of claim 1 further 30 comprising:

providing a pager server coupled to exchange data with said communication profile database, wherein said communication services further include a pager alert service and wherein said communication options further include a pager alert option, said pager server being configured to transmit, when said pager alert option is enabled, an alert to a pager through said telephony-centric network if an e-mail message is received by said subscriber through said data-centric 40 network, said pager having a page number that is also specified as part of said pager alert option.

6. The computer-implemented method of claim 1 wherein said plurality of communication services include a call forwarding service configured to permit said subscriber to 45 specify whether a call received at a telephone number associated with said account be forwarded to a forwarding telephone number, said communication options including a call forwarding enable option and said forwarding telephone number.

7. The computer-implemented method of claim 1 wherein said plurality of communication services include an alternate number service, said communication options including an alternate number service enable option associated with said alternate number service and an alternate telephone number, 53 said alternate number service enable option, when enabled by said subscriber, permits a caller to said subscriber at said unified messaging system to elect to forward a call by said caller to an alternate telephone associated with said alternate telephone number.

8. The computer-implemented method of claim I wherein said plurality of communication services include a followme service, said communication options including a followme service enable option associated with said followme service and a set of telephone numbers, said followme service enable option when enabled by said subscriber, permits a caller to said subscriber at said unified messaging

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system to elect to forward a call by said caller to a telephone associated with said set of telephone numbers.

9. The computer-implemented method of claim 8 wherein said follow-me service is configured to ring in sequence each one of said telephones associated with said set of telephone numbers until said call by said caller is accepted.

- 10. The computer-implemented method of claim 9 wherein said follow-me service is configured to ring first a last-found telephone number, said last-found telephone number representing a telephone number associated with a phone previously employed by said subscriber to answer an immediately preceding call to said subscriber.
- 11. The computer-implemented method of claim 8 wherein said single graphical menu comprises at least:
 - a first display area for showing said on-demand communication service, said on-demand communication enable option, and said forwarding number.
- 12. The computer-implemented method of claim 11 wherein said single graphical menu further comprises:
 - a second display area for showing a second communication service, and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu.
- 13. The computer-implemented method of claim 12 wherein said on-demand communication service is selected from a follow-ne service, an alternate number service, and a paging service, and wherein said second communication service is selected from a call forwarding service, a follow-me service, an alternate number service, a message alert service, a fax receiving service, and a paging service.

14. The computer-implemented method of claim 12 wherein the second communication option includes a second enable option for enabling or disabling the second communication service.

15. The computer-implemented method of claim 14 wherein the second communication option includes a routing option.

16. The computer-implemented method of claim 15 wherein the forwarding number includes a plurality of numbers, and wherein the second routing option includes a plurality of routings.

- 17. A data structure for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephony-centric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and via telephones coupled to said telephony-centric network, said data structure for use with:
 - a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said subscriber; said data structure comprising:
 - a single graphical menu for displaying said communication options for each of said communication services at the name time, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first

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communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area - 5 and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second 10 communication option includes a second enable option for enabling or disabling the second communication service;

said single graphical menu capable of being displayed on one of said display terminals using a computer 15 server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computer-implemented control center;

wherein a telephony server is coupled to exchange data 20 with said communication profile database;

- an audible representation of said communication options capable of being provided to one of said telephones, using said telephony server, when said subscriber employs said one of said telephones to 25 access said computer-implemented control center;
- a first change to at least one of said communication options received from said subscriber via said one of said display terminals at said computer server, said first change to said communication options pertain- 30 ing to either said voice telephone service or said e-mail service:

wherein said first change is updated to said account in said subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, and wherein subsequent messages to said subscriber at said unified massaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

18. A computer readable media including instructions for a computer-implemented method for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services, said communication options include parameters associated with individual ones of said plurality of said communication services and routings among said plurality of communication services, said plurality of communication services comprising a voice telephone service through a telephonycentric network and an e-mail service through a data-centric network, said communication options being accessible via display terminals coupled to said data-centric network and

via telephones coupled to said telephony-centric network, said instructions comprising;

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- providing a subscriber communication profile database, said subscriber communication profile database having therein an account pertaining to said subscriber, said account including said communication options for said
- generating a single graphical menu for displaying said communication options for each of said communication services at the same time, wherein said single graphical menu comprises at least a first display area for showing a first communication service and a first communication option associated with said first communication service, and a second display area for showing a second communication service and a second communication option associated with said second communication service, the first display area and the second display area being displayed at the same time in said single graphical menu, and wherein the first communication option includes a first enable option for enabling or disabling the first communication service, and wherein the second communication option includes a second enable option for enabling or disabling the second communication service;
- visually displaying said single graphical menu on one of said display terminals, using a computer server coupled to exchange data with said subscriber communication profile database, when said subscriber employs said one of said display terminals to access said computerimplemented control center;
- providing a telephony server coupled to exchange data with said communication profile database;
- audibly representing said communication options to one of said telephones, using said telephony cerier, when said subscriber employs said one of said telephones to access said computer-implemented control center;
- receiving from said subscriber via said one of said display terminals at said computer server a first change to at least one of said communication options, said first change to said communication options pertains to either said voice telephone service or said e-mail service; and
- updating said first change to said account in said subscriber communication profile database, thereby resulting in a first updated subscriber communication profile database, wherein subsequent messages to said subscriber at said unified messaging system, including said voice telephone service, are handled in accordance with said first updated subscriber communication profile database.

EXHIBIT 3



(12) United States Patent Swartz

(10) Patent No.:

US 6,445,694 B1

(45) Date of Patent:

Sep. 3, 2002

(54)	INTERNET CONTROLLED TELEPHONE
` '	SYSTEM

(76) Inventor: Robert Swartz, 1066 Centerfield Ct., Highland Park, IL (US) 60035

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/033,287

(22) Filed: Mar. 2, 1998

Related U.S. Application Data

(60) Provisional application No. 60/040,046, filed on Mar. 7, 1997.

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Primary Examiner—Douglas Olms Assistant Examiner—Phirin Sam (74) Attorney, Agent, or Firm—Charles G. Call

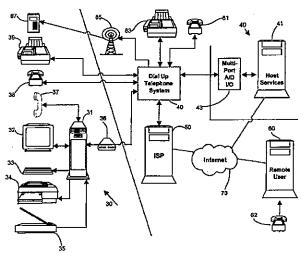
(57) ABSTRACT

An Internet controlled telephony system employing a host services processor connected to a subscriber via the Internet and further connected to the public switched telephone system (PSTN). The subscriber employs a web interface to populate a database with preference data which is used by the host services processor to handle incoming calls and establish outgoing telephone connections in accordance with the preference data provided by the subscriber. Incoming calls to a telephone number assigned to the subscriber may be automatically forwarded to any telephone number specified by the preference data. The subscriber may also use the web interface to specify whether call waiting is to be activated, to screen or reroute calls from designated numbers, for recording voice mail messages in designated voice mailboxes, for selectively playing back voice mail messages via the web interface or for forwarding voice mail as an email attachment, for handling incoming fax transmissions using character recognition and email attachment functions, and for automatically paging the subscriber when incoming voice mail, fax or email messages are received, all in accordance with the preference data supplied by the subscriber using the web interface. Outgoing connections and conference calls may be initiated using the web interface, and the subscriber may block the operation of caller identification functions. Call progress information may be visually displayed to the subscriber during calls by

13 Claims, 11 Drawing Sheets

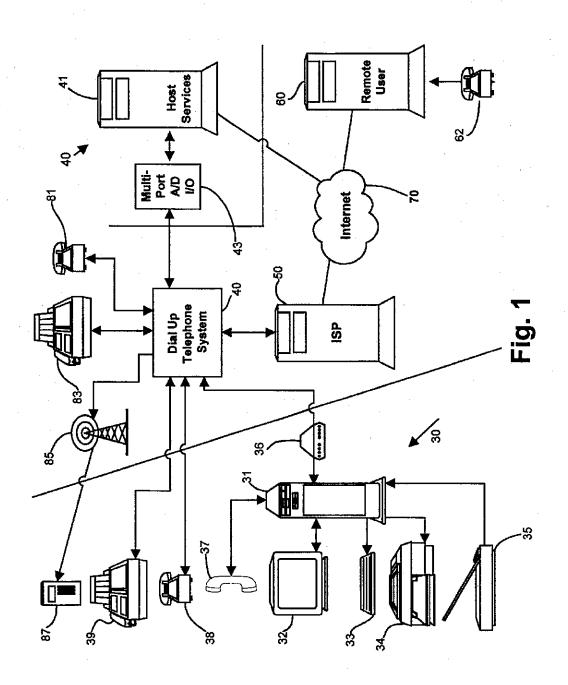
transmitting web pages from the host services computer to

the subscriber's web browser.



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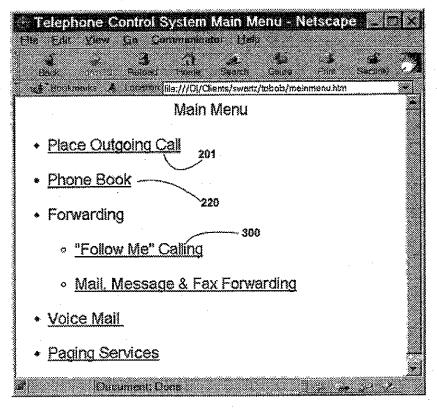


Fig. 2

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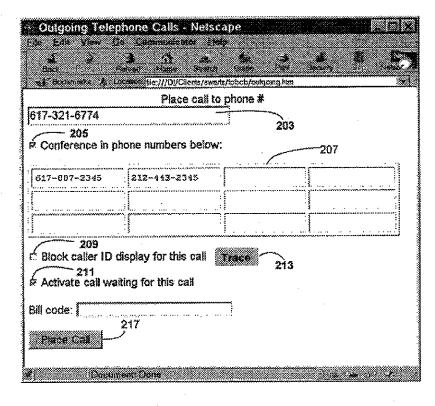


Fig. 3

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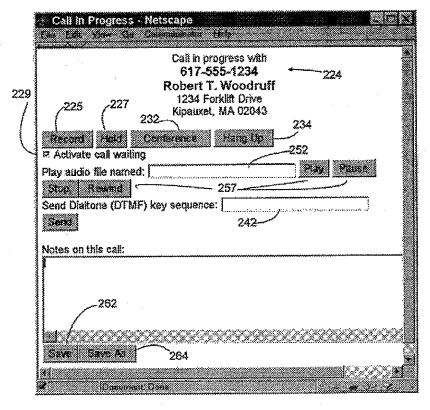


Fig.4

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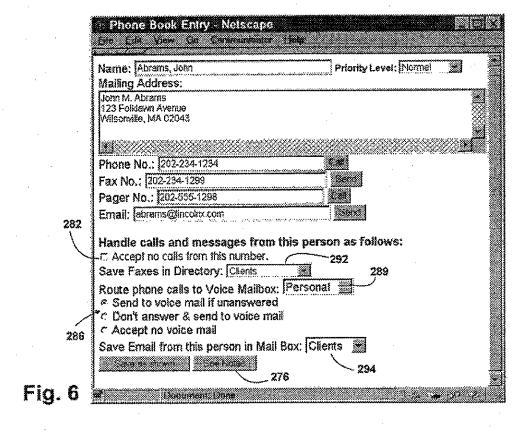
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VAME	PHONE NO.	FAX NO.	EMAIL
brams, John	(202) 234-1234	(202) 234-1299	abrams@lincolnx.com
Baxter Chemical	(312) 123-4567	(312) 123-9921	sales@baxterchem.com
Sartholomew. Cen	, in the state of		kbart@wiggles.com
Branson. Charles	(415) 555-1212	(415) 345-9908	
Candy, Wilson	(617) 890-0987		CWilson12@aol.com

Fig. 5

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302 "Follow Me" Voice Calling Options Attempt Internet voice connection to subscriber before forwarding.				
•			except;	
From		То	Forward to	
Time	Date*	Time	Phone Number	
10:00 am	9/12/1398	5:30 pm	212-553-2295	
-				
	oming voice or	oming voice calls to 617-5	oming voice calls to 617-555-1254 om To Time Date* Time	

Fig. 7

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Forwarding Options - Netscape	
a Lin der de Constitue Des	
Forward Email to:	
Save and forward or Forward only	•
Charles to the Control of the Contro	
Send Voice Mail as Email text to:	······································
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Send Voice Mail as Audio Email attachment to:	***************************************
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ermat; c WAV c AU s RealAudie c PCM	
Erase voicemail after sending as Email attachment	
Send Fax as email attachment to:	~~~~
end as: F File & Link to File	4. *4. · · ·
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Erase Fax file after sending as email attachment	•
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Incompact Charles	

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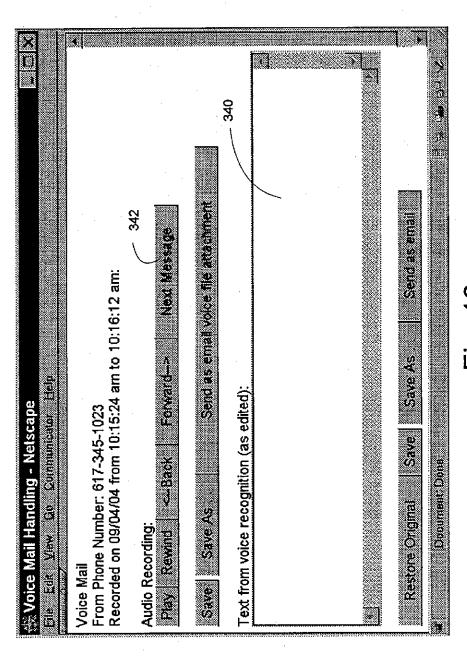
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filename	of Greeting Res	ording:	www.w	
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² ending Voi	cemail:			00000000
Date	Time	From	Beginning	Action
9/4/98	10:15 am	617-345-0123	THIS IS BOB WILSON .	Hear Read Delete
(I				
	Decument Dans			2 2 2 2 2 2 2

Fig. 9

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7.72			
Paging Number: 781-555-6754		422	
ন Page on incoming voice mail ে Page on each ନ Page on 1st new only	g voice mail Page on 1st	new only	
ନ୍ତ Page on incoming Email ଦ Page on each ଜ Page on 1st new only	g Email Page on 1st	new only	
দ Page on incoming fax ৫ Page on each େ Page on 1st new only	g fax Page on 1st	new only	
Cost Page Anty	# 12		
Date	Time	From	Pager Message Sent
MO 09/04/97	10:1Зап	617 555-1212	Fax received. 5 pages
MO 09/04/97	me22:11	202 555-2345	1st Voice Mail. 34 sec.
09/04/97	02:09pm	joslx2@aol.com	Email. 124 lines.

INTERNET CONTROLLED TELEPHONE SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of the prior filed copending U.S. Provisional Patent Application Ser. No. 60/040,046 filed on Mar. 7, 1997.

FIELD OF THE INVENTION

This invention relates to computer controlled telephone systems and more particularly to a telephone system which may be controlled using commands transmitted from a subscriber location over the Internet to a host computer 15 which provides telephone services.

BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 is a schematic diagram showing an illustrative arrangement of hardware components which provide the 20 infrastructure for implementing a preferred embodiment of the invention:
- FIG. 2 shows the screen display of a main menu giving options available to the subscriber;
- FIG. 3 illustrates a screen displayed to enable the sub- 25 scriber to place a call and request a conference call;
- FIG. 4 depicts an illustrative screen display which enables the subscriber to control a call in progress;
- scriber to review and select particular persons or firms listed in a phone book database;
- FIG. 6 shows a screen displayed when a form is presented to enable the subscriber to add or edit information in a phone book entry and to take place calls and the like to the person 35
- FIG. 7 illustrates a screen which is displayed to enable call forwarding and "follow me" calling;
- FIG. 8 illustrates a further screen display which enables the subscriber to select and change a variety of call and 40 message forwarding options;
- FIG. 9 is a screen display which enables the subscriber to create and specify features of a voice mailbox;
- FIG. 10 is a screen display which is allows the subscriber to view and control the playback of voice messages left in a voice mailbox; and
- FIG. 11 is a screen display which enables the user to select various options and control the operation of an automatic the invention.

DETAILED DESCRIPTION

The infrastructure used to implement the present invention may consist entirely of conventional and readily avail- 55 able hardware and software components. As will be seen from the discussion that follows, the hardware and software used at the subscriber (client) location is already present and in use in many well equipped home and small office computer installations. Similarly, the principal hardware and 60 software components needed by the host services computer (server) are similarly readily available, as are the software development tools needed to prepare the limited amount of special purpose programs required for execution at the

FIG. 1 of the drawings shows the manner in which various conventional hardware components may be interconnected

to provide an illustrative hardware infrastructure for implementing the invention. The arrangement seen in FIG. 1 provides the facilities needed for controlling a variety of communications services, including telephone, email, fax and paging services provided by a host services computer operating under the control of either or both (1) a World Wide Web interface and (2) a telephone interface.

A typical subscriber location seen at 30 includes, by way of example, a personal computer 31, a monitor 32 for 10 displaying text and images, a keyboard 33 for entering data and commands from the user, a printer 34, a digital scanner 35, a modem 36 and a microphone and headset/speaker represented in FIG. 1 by the handset 37.

The modem 36 is used to establish a dialup telephone connection via the conventional telephone network 40 to a remote computer 50 which operates as an Internet Service Provider (ISP). The ISP computer 50 provides the connected computer 31 with access to the Internet, enabling the subscriber computer 31 to exchange data via the Internet seen at 70 in FIG. 1 with other computers, such as the computer 41 at the host services location 40 and a computer 60 which is representative of a selected one of the millions of remote computers connected to the Internet. The dialup connection between computers 31 and 50 seen in FIG. 1 is merely illustrative of one common method for connecting a subscriber location to the Internet. Alternatively, the conventional modem 36 may be replaced by a cable modem, satellite connection, local area network gateway, proxy server or a connected router. All such communications FIG. 5 is a screen display presented to enable the sub- 30 facilities and the components for providing Internet access are conventional.

The host services computer 41 is connected to the Internet 70 and employs a multi-port input/output (I/O) unit 43 to permit a number of outside callers to be concurrently connected via the dialup telephone system 40. The dialup telephone system 40 also provides conventional connections to a conventional telephone stationset 38 and a conventional facsimile machine 39, both of which are provided with separate assigned lines and telephone numbers for use at the subscriber location 30. In addition, the telephone system 40 may also interconnect any other connected telephone or facsimile machine, as illustrated at 81 and 83 respectively, as well as other services, such as a remote radio transmission facility 85 used to provide communication to a pager 87 which is assigned to and used by the subscriber. Similarly, the subscriber may utilize a cellular phone (not shown) when traveling to remote locations. As discussed below, the subscriber controls and uses the host service computer using these conventional instrumentalities. Importantly, convenpaging system implemented by the disclosed embodiment of 50 tional web browser software running on the computer 31 may be employed, along with voice commands and DTMF (dialtone) signaling via the conventional telephone hookup, to control the state and function of the host services computer 41.

The host services computer may alternatively take the form of an Intranet server which is connected to a plurality of client (subscriber) computers by means of a local area network and/or a wide area network. In addition, the host services computer may be connected via a multiport I/O device to serve a number of telephone stationsets. In this arrangement, the host services computer operates as both a shared computer resource for the connected client computers and provides PBX services to the connected subscriber telephone stationsets. Internet connections are provided via an Internet gateway on the LAN/WAN such that both the host services computer and the connected subscriber computers have Internet access.

Note further that, with the host services computer operating as a PBS, a direct telephone voice line connection may be established between host services computer and individual telephone subscriber stationsets. In this way, incoming calls may be directly connected to the called subscriber 5 stationset without forwarding the incoming call through the dialup telephone facility. A multiplexed telephone line, such as a leased T1 carrier line, may be used to connect a plurality of subscriber phones to the host services computer, enabling the servicing of branch offices. By concentrating traffic in a 10 shared wideband leased line, branch locations can be served through a central PBX provided by the host services computer at less cost by eliminating individual lines.

The host services computer 41 may employ conventional server operating system software, such as the SCO OpenS- 15 erver operating system sold by The Santa Cruz Operation, Inc. (SCO), Santa Cruz, Calif. 95061. This client/server UNIX operating system for Intel processor-based platforms includes graphical system administration and software management facilities for managing both local and remote 20 systems. The program's Motif GUI provides the look and feel of Microsoft Windows and includes TCP/IP communication gateway services for local and network access external information services. The computer 41 may advantageously equipped with an enhanced audio input/output 25 facilities, such as the Dialogic D/240SC 24 channel digital interface board which provides a voice channel interface between the computer 41 and incoming audio channels from the connected telephone lines as well as call management functions. The D/240SC is marketed by Dialogic Corp. of 30 Parsippany, N.J. 07054. As discussed below, it is the principal function of the host services computer 41 to receive and respond to data and commands received from the subscriber location 30, either in the form of HTML form submissions or in the form of voice and/or dialtone 35 commands, and to perform requested functions in response to those commands.

Web Interface

A wide variety of available interface mechanisms can be utilized to facilitate communications and control between 40 the subscriber and the host services computer. As described in more detail below, a highly effective interface may be readily implemented using a conventional HTML web pages which are sent to the subscriber computer from the host services computer, including HTML forms which are trans- 45 be partitioned into three classes: mitted to request and accept specific information from the subscriber using as "fill-in-the-blanks" input boxes, memo boxes, check boxes, and radio buttons. Javascript may be advantageously included in the HTML pages to provide validity checking of entered data by the subscriber com- 50 puter. Alternatively, these and other interface functions and "client-side" operations may be implemented special purpose "plug-in" programs which work with a conventional browser program, or by Java and/or Active-X applets which are transmitted from the host services computer for execu- 55 tion on the subscriber computer using facilities provided by the browser. If desired, special-purpose client application programs may be used to directly communicate with the host services computer without using a general purpose browser.

In one particularly useful form, the functions performed at 60 the subscriber location as contemplated by the present invention can advantageously be implemented by routines stored as dynamic link libraries which make telephone subscriber functions available through an open application program interface (API). By way of example, the widely 65 used Microsoft Windows 95 operating system provides specifications for a robust computer/telephone interface

named "TAPI" which is fully documented in the Microsoft Win32 Software Development Kit (SDK) which includes documentation, tools, and sample code to assist application programmers in adapting programs to be compatible with TAPI. Two documents, the Microsoft Telephony Programmer's Reference and the Microsoft Telephony Service Provider Interface (TSPI) for Telephony, are also available from Microsoft Corp. to provide additional development guidance. The programmer's reference is intended to document the functionality that an application using TAPI will need. The service provider documentation assists developers and telephone equipment vendors in writing their own TAPI

Telephone services are integrated into Windows using the Windows Open Systems Architecture ("WOSA"). WOSA uses a Windows dynamic-link library (DLL) that allows software components to be linked at runtime. In this way, applications are able to connect to services dynamically. An application needs to know only the definition of the interface, not its implementation. Telephony services under Windows follow the WOSA model. This means that there exists a Telephony API, which is the application programmers access to telephony services, a Telephony SPI (Service Provider Interface) which is implemented by telephony service vendors, and a Telephony Dynamic Link Library (the TAPI DDL) which is part of the Windows operating system. Applications are presented with a uniform set of devices accessed uniformly via the API without needing to know which service provider actually ends up controlling which device. Similarly, service providers just execute requests on behalf of the Windows Telephony DLL; they are unaware that these requests are the result of multiple applications using the API. The SPI definition reflects this single user model at the service provider level. All this multiplexing demultiplexing of requests and replies is confined to the Telephony DLL. In an environment with multiple PCs on a local area network, it is possible to develop applications and/or service providers that are distributed in nature. With a distributed service provider, a service provider instance on one client PC is able to communicate with its peers on other client PCs, providing potentially a more powerful model as it can combine knowledge about multiple client PCs that may be involved with the same call. The services provided by the line and phone abstractions of the Telephony SPI can

- (1) Basic Services are a minimal subset of core services. They must be provided by all service providers. The function contained in basic telephony roughly correspond to that of POTS. Phone device services are not part of basic telephony.
- (2) Supplementary Services are the collection of all the services defined by the SPI, but not included in the basic telephony subset. It includes all so-called supplementary features found on modern PBXs including hold, transfer, conference, park, etc. All supplementary features are optional. This means that a service provider decides which of these services it does or does not provide. The TAPI DLL can query a line or phone device for the set of supplementary services it provides. Note that a single supplementary service may consist of multiple function calls and messages. It is important to point out that the Telephony SPI defines the meaning (i.e., behavior) for each of these supplementary fea-
- (3) Extended Services (or Device Specific Services) include all service provider defined extensions to the SPI. A mechanism is defined in the SPI, and reflected

in the API, that allows service provider vendors to extend the Telephony SPI using device-specific extensions. Since the SPI only defines the extension mechanism, definition of the extended service behavior must be completely specified by the service provider. 5 The extension mechanism allows a service provider to define new values to enumeration types and bit flags, as well as to add fields to data structures. The interpretation of extensions is keyed off of the service provider's manufacturer ID. Special function and callbacks are 10 provided in the SPI that allow an application to directly communicate with a service provider. Many of the control functions contemplated by the present invention which are controlled through the TAPI interface by the SPI DLL are in fact executed, as will be described, 15 by the host services computer in ways that are invisible to the user or the application program which is executing on the subscriber computer.

As an alternative to the TAPI implementation noted above, the host services computer may present an API to 20 programs which execute on the subscriber computers and communicate with the host computer over the Internet or an equivalent data pathway. With the remote host services computer providing an API which makes available a set of telephony functions, application programmers may imple- 25 ment a rich and expandable set collection of special purpose programs which execute on the subscriber computer to implement the features and functions such as those described below in the example HTML/CGI implementation of the invention. When these application programs take the 30 form of Java applets or Active-X applets that are downloadable from the host services computer to the subscriber computer, the necessity for resident special purpose software at the subscriber location is eliminated and the cost savings associated with "thin client" network computer architectures 35 are preserved.

HTTP/CGI Control

While such special purpose programs of the type noted above provide a high degree of interoperability with other application programs, they must be specially loaded for 40 execution into each subscriber computer. By using the capabilities found in existing web browser software, it is possible to provide the desired functionality with no new software of any kind being required at the subscriber location. Thus, in perhaps its simplest form, the present inven- 45 tion can be readily implemented by using a conventional web browser program (e.g. Netscape Navigator or Microsoft Explorer) which executes on the subscriber computer 31 seen in FIG. 1, and conventional web server software (e.g. BSD Unix 2.2, Apache 1.1.1) or an SQL server which 50 interoperates with a relational database (such as the Sybase SQL Server V.11). On the server side, web page requests or form submission from the subscriber computer's web browser are sent to the host services computer 41 using the HTTP protocol. At the host services computer 41, the 55 received transmissions from the subscriber location may be handled by Common Gateway Interface (CGI) programs which typically process information from the subscriber and return HTML pages for display on the subscriber's web browser. The HTTP/CGI interface infrastructure is conven- 60 illustrated in the drawings as shown by the table below: tional and is described, for example, in Developing CGI Applications with PERL, by John Deep and Peter Holfelder, John Wiley & Sons (1966), ISBN 0-471-14158-5.

To establish a working relationship between the host services computer and the subscriber, the host services 65 computer makes available to the public at large a "home page" at a predetermined URL (Universal Resource

Locator). The home page, when displayed, identifies and makes available descriptive information about the system, inviting members of the public to subscribe to the offered services by displaying, completing and submitting a subscription form.

The HTML subscription form shown enables user to establish an account with the operator of the host services computer. When the subscription form is submitted, the host services computer stores the descriptive information entered on the submitted form in persistent storage (typically a database on a local magnetic disk drive) accessible to the host computer. As is conventional, the subscription process may advantageously employ conventional secure encrypted communications protocols for obtaining the subscriber's credit card number and authorization to facilitate billing. As will be understood, the subscriber may be billed for services based on monthly fees or measured use of the system at rates which, because of economies achieved by the system, may be significantly lower than the costs associated with such services when provided by conventional means. When the subscription form is received and accepted, the new subscriber may be sent a user ID and password (which may be done by conventional mail at the same time user manuals or other information is supplied to the subscriber).

In accordance with an important feature of the invention, the subscriber can access his or her personalized phone services and database from any computer having access to the Internet, and need not be limited to a particular computer on which special programs or data are stored. At the same time, the password protection afforded by the system assures the security of the information stored for access by the subscriber. The host services may be advantageously provided by an existing services provider, such as an Internet Services Provider (ISP), a cable modem company, a telephone access provider, an telephone answering service, a paging services company, or the like.

At the same time the new subscription account is established, the host service assigns a telephone number to the new subscriber service and informs the subscriber of that assigned number (which may conveniently be an 800 or 888 number, eliminating the need for the subscriber to independently obtain 800 or 888 number service). This telephone number will be referred to hereafter as the "assigned subscriber number". Any call to the assigned subscriber number is answered by and handled by the host services computer 41 in the manner determined in part by preference data provided by the subscriber using HTML forms as described in more detail below, or by transmitting voice or DTMF commands over the conventional telephone system.

Using the web browser software running on the subscriber computer 31, the subscriber accesses a predetermined (and typically bookmarked) web page at a predetermined URL. The host services computer responds with a request to the subscriber to enter his or her assigned user ID and password, and if that step is performed satisfactorily, the host services computer transmits a main menu webpage of the type illustrated in by FIG. 2.

The main menu page seen in FIG. 2 provides hypertext links to six different web pages, each of which is also

	Menu Anchor Text	Drawing
5	Place Outgoing Call	FIG. 3
	Phone Book	FIG. 5

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Menu Anchor Text	Drawing
"Follow Me" Calling	FIG. 7
Mail, Message & Fax	FIG. 8
Forwarding	
Voice Mail	FIG. 9
Paging Services	FIG. 11

Place Outgoing Call When the subscriber "clicks on" the anchor text "Place Outgoing Call" at 201 on the main menu webpage seen in FIG. 2, the browser sends a request for a further webpage specified by a URL associated with the anchor text in the HTML text which created the main menu.

Note that, in general, the value of a URL sent when a hyperlink is activated is the file location of web page or a predetermined CGI script, along with parameters passed to the server for execution by that script. Note that, in general, because the hypertext links (URL's) that are sent to the 20 server are formed from text on pages written by the server, the URL may contain state information, either in the form of a file designation or in the form of CGI parameters, which identify the subscriber as well as the context in which the subscriber is making a request, and the specific request or 25 data being sent to the server.

The selection by the subscriber of the main menu option represented by the hypertext anchor text "Place Outgoing Call" causes the HTML for displaying the form seen in FIG. 3 to be displayed by the browser. This form allows the user to enter a phone number to be called in the input line form control at 203. In addition, by clicking on the checkbox at 205 and entering one or more numbers in the input line boxes arrayed in a table at 207, the subscriber may specify the telephone numbers of additional parties to be included in 35 a conference call. The conference call may be implemented directly by the host services computer 41 which places all calls to all of the numbers specified in the form seen in FIG. 3, or the conference call may be requested from the dial up telephone system.

Control of Telephone Central Office Services

Most public telephone services offer a variety of service functions which can be advantageously implemented using the user interface features of the present invention. To use many of these functions, the user must normally know and key-in control key sequences on the telephone keypad. In accordance with a feature of the present invention, these functions may be advantageously automated by the host services computer in response to easily understood menu selections made by the subscriber using the webpage inter- 50 face or voice command interface. The conventional telephone system functions which can be advantageously implemented in this way include those shown in the following illustrative examples, described using the control dialtone key sequence command codes employed by the Bell Atlantic 55 telephone service. These functions include the activation and deactivation of call waiting services under the control of the HTML checkbox form control seen at 211 in FIG. 3, the blocking and unblocking of caller ID displays in response to the checkbox entry at 209 in FIG. 3, and the activation of call 60 line does not answer or is busy, the subscriber is notified of

As an alternative to the use of DTMF key sequences to control telephone central offices, the SS7 call management protocol may be used. AT&T developed and made available a set of 1A ESS features called LASS (Local Area Signaling 65 request a trace of the last incoming call. In response, the host Services). As expanded by customized software enhancements originating with Pacific Bell, these functions are also

available under the name CLASS (Custom Local Area Signaling Services). These services allow increased customer control of phone calls. Existing customer lines can be used provide call management and security services. A key feature of CLASS resides in the ability of the terminating office to obtain the identity of the calling party. Special terminating treatment based on the identity of the calling party can then be provided. The CLASS features are dependent upon an SS/CCS (Signaling System 7/Common Channel Signaling) network and use the SS7 Call Management Mode of operation. SS7 is an advanced signaling system that features flexible message formatting, high speed data transmission (56/64 kbps) and digital technology. CCS is defined as a private network for transporting signaling messages. In the existing voice and signaling network, signaling and voice use the same path but cannot use it at the same time. With SS7, signaling and voice have been separated. Signaling (SS7) is over a high-speed data link which carries signaling for more than one trunk. In the context of the present invention, the SS7 protocol provides a more direct and effective way for the host services computer to control the functions of the connected dialup telephone system than the conventional DTMF signaling mechanisms which are set forth here for simplicity.

If the subscriber wishes to prevent the called parties caller ID system from displaying the subscribers number on the next call, the box at 209 is checked and the host services computer requests the central office to perform per call blocking by sending the dialtone sequence "*67" to the central office. If the telephone company has been requested to block caller ID display on all outgoing calls, the line associated with checkbox 209 would instead read "Unblock display of your number by caller ID for next call only" and the host services computer would instead sends the sequence "*82" to remove perform line blocking for the next call only. The host services computer can interrogate the central office to determine whether or not line blocking has been requested by dialing a predetermined number which will provide an announcement indicating line blocking status for the calling 40 number.

The functions noted above may be performed by the telephone central office in response to command codes sent from the host services computer to the central office. Call waiting is activated when the checkbox at 211 is checked by sending the key sequence "*70" to the central office, and is deactivated by the sending same code when the box on line 211 is unchecked.

If only one additional party is to be conferenced in, the commonly available "three way calling" service offered by telephone system may be used. When the user enters the telephone number of the third party to be added to an existing call at 207 and checks at 205, the host services first dials the number entered in input line 203 and, when that connection is established, the computer flashes the line (i.e., places the line on-hook momentarily), waits for three beeps and a dial tone from the central office, dials the number previously entered at 207, and when the added party answers, again flashes the line to bring all three parties together for the desired conferenced call. If the third party that condition and the line is flashed twice to reconnect the first call.

When the button 213 on the form seen in FIG. 3 is pressed, a command is sent to the host services computer services computer returns a form (dialog box) advising the subscriber of a service charge will be incurred and request-

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ing confirmation that the requested function should nonetheless be performed. If confirmed by the subscriber, the host services computer transmits the dialtone key sequence "*57" to the central office, which thereafter provides announcements to the subscriber indicating that the call was 5 traced and providing further instructions.

After the information in the input line 203 identifying the number to be entered is completed, and optionally the conferenced-in numbers are entered at 207, the user presses the button labeled "Place Call" at 217. In response, the 10 server dials the call to establish a voice connection with the called party or parties, and displays the call-in-progress form seen in FIG. 4.

As the call progresses, the normal audible signals (busy signals, ringing signals, etc.) are sent to the subscriber over 15 the telephone voice connection, and may be supplemented by additional voice status announcements. Typically, such notifications to the subscriber may be sent by sent by both voice announcement and audible signals over the voice connection or by sending status displays in the form of 20 revised HTML pages for display on the subscriber's monitor. In accordance with the invention, notification messages displayed on the monitor are frequently less disruptive; accordingly, by checking the checkbox seen at 223 on the form of FIG. 4, the subscriber may disable the supplemental 25 voice announcements.

The full identification of the incoming party is displayed on the call-in-progress form as indicated at 224. To provide this complete display, the host services computer matches the telephone number of the calling telephone, provided by 30 the telephone system's automatic number identification (ANI) service, against a "phone book" database (to be discussed later) of frequently used phone numbers to obtain, in addition to the ANI information, other descriptive information about the calling party. The name or number of the 35 calling party may form the anchor text for a hyperlink to even more detailed phonebook information about the party of the type to be discussed later in connection with FIGS. 5 and 6.

When the subscriber places a call to a busy line, or if there 40 is no answer before a time out period expires, the host services computer presents a dialog box form to the subscriber showing the status ("No Answer" or "Busy") and displaying a request prompt "Continue automatic redialing?" [Yes, No]. If redialing is requested, it may be performed by the host services computer or, in the alternative, the central office may be requested to perform repeat dialing by sending the key sequence "*66". Repeat dialing by the central office may be deactivated on the request of the subscriber by notifying the host services computer which, in 50 turn, transmits the dialtone sequence "*68" to deactivate central office repeat dialing.

Other call in progress controls which are provided by the call-in-progress form of FIG. 4. The button 225 labeled "Record" may be pressed to create a recording of the 55 conversation, preferably by first generating a confirming dialog box and, if desired, informing the called party by voice announcement or signal, as appropriate, that the conversation is being recorded. By pressing the "Hold" button 227, the call in progress may be placed on hold in the normal way so that, for example, a incoming call signaled by the "call waiting" function can be handled. So that more important calls or data connections are not interrupted, call waiting may be deactivated by checking the checkbox at 229. By pressing the button 232 labeled "Conference," the 55 subscriber may request to have additional parties included in a conference call, which is accomplished by again display-

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ing the outgoing call specification form seen in FIG. 3. The subscriber may terminate a call by simply placing the handset on hook in the usual fashion, or by pressing the "Hang up" button 234 which has the same effect.

It is frequently desired to send a predetermined DTMF key sequence after a connection is established in order to perform specialized functions. In addition, it may be desirable to play a predetermined audio file so that it can be heard by the party with whom a connection has been established. To send a DTMF key sequence, it may be entered in text in on the input line at 242 and then sent by pressing the form button 246 labeled "Send." Similarly, the filename or other designation of an audio file recorded at the server computer 41, or the URL of an audio file available on the Internet, may be entered in the input line at 252. The designated audio file is sent over the voice telephone connection under the control of the buttons at 257 labeled "Play," "Pause," "Stop" and "Rewind."

For the convenience of the subscriber, notes on the call in progress may be entered in the memo box seen at 262 in FIG. 2. Pressing the "Save" form button at 264 causes the entered notes to be saved as a file at the server at a location accessible by accessing the phone book entry for the party as discussed in connection with FIG. 6. Alternatively, by pressing the "Save As" button, the subscriber is presented with a form that enables the notes to be saved at a named location on persistent storage accessible to the host services computer. Note that such information is saved at the host services computer 41 and not at the subscriber computer 31 so that the information saved is available to the subscriber regardless of the particular client computer used to access the system. It is an important feature of this aspect of the invention that subscriber may access his or her personal information from any location using any web browser and/or telephone subscriber station, such as a public telephone at an airport.

Phone Book

Frequently called numbers may be accessed and dialed using a phone book database of information. By clicking on the hyperlink anchor text "Phone Book" seen at 270 on the main menu of FIG. 2, a phone book listing page illustrated in FIG. 5 may be displayed. This listing displays an alphabetical list of persons and firms previously stored by the subscriber. Using the page designating navigation bar listing seen at 272 in FIG. 5, the subscriber may go to any desired subsection of the phone book to find an existing listing. By clicking on the name of the person or firm of interest, a form containing more detailed information is presented as shown in FIG. 6. If the person of interest is not found on the listing of FIG. 5, the hyperlink anchor text "Add New" at 274 at the right side of the navigation bar 272 may be clicked on to display a blank for of the type shown in FIG. 5 to enable a new entry to be created.

The form seen at FIG. 6 accepts and, when submitted, a stores information about frequently called numbers and is the source of database information displayable at 224 in the call-in-progress form. Notes saved during previous conversations with the person identified on the form may be viewed by pressing the button labeled "See Notes" at 276 in FIG. 6. Note that this button will only be present when notes have been previously recorded for that person or firm; otherwise, the CGI script which generates the form in response to the activation of the associate hyperlink on the form of FIG. 5 will not include the button on the generated form. The phone book data itself may be advantageously stored using a conventional SQL server which interoperates with a relational database (such as the Sybase SQL Server V.11).

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The database for each called number potentially includes not only the phone number for that party, but also fax and pager numbers and email addresses. Phone calls, fax transmissions, paging transmissions and email messages may be initiated immediately from the form seen in FIG. 6 by pressing the appropriate one of the activation buttons seen at 280. In addition, by checking the checkbox at 282, calls originating from this caller may be screened and blocked altogether, or may be routed to voice mail according to the instructions provided by the subscriber selectable 10 radio button options indicated at 286. The drop-down list box at 289 permits the subscriber to designate the voice mailbox to which voice mail from this caller is directed. Similarly, the drop-down list boxes at 293 and 294 respectively allow the subscriber to designate the mailbox loca- 15 tions for fax transmission files and email messages received from this caller. When the form is completed to the subscriber's satisfaction, the information it contains is saved for future use in the database maintained by the host services computer when the subscriber presses the "Save as Shown" 20 seen in FIG. 8. To effect email handling, the host services button 299 at the bottom of the form of FIG. 6. Call Forwarding

When hypertext option 300 is clicked on the main menu form seen in FIG. 2, the form seen in FIG. 7 is displayed on the subscriber's monitor. This form allows the subscriber to 25 specify the manner in which incoming calls are forwarded and implements "Follow me" call forwarding to enable calls to be automatically forwarded to one of plurality of different numbers in accordance with a predetermined time schedule.

First, at the times when the subscriber is using a particular 30 computer, he or she may place a checkbox at 302 to instruct the host services computer to attempt to establish a voice connection via the Internet using IP telephony to the IP (Internet Protocol) address being used (during this session) by the subscriber computer. IP telephony uses the Internet to 35 subscriber as shown. send audio between two or more computer users in real time, so the users can converse, and offers the ability to combine voice and data on one network. IP telephony also offers low-cost long distance "telephone" service (assuming the user already has a multimedia PC and a fixed-rate Internet 40 service provider [ISP] account). IP gateways bridge the traditional circuit-switched telephony world with the Internet and offer the advantages of IP telephony to the most common, cheapest, most mobile, and easiest-to-use terminal in the world: the standard telephone. The gateway takes the 45 standard telephone signal, digitizes it (if it is not already digital), significantly compresses it, packetizes it for the Internet using Internet Protocol (IP), and routes it to a destination over the Internet. The gateway reverses the operation for packets coming in from the network and going 50 out the phone. Both operations (coming from and going to the phone network) take place at the same time, allowing a full-duplex (two-way) conversation. Gateway products which may be used at the host services computer 41 are conventional and may be obtained from Dialogic and other 55 vendors, and are compatible with client (subscriber) software which enables the connected subscriber computer to receive and send voice signals over the IP connection. When IP telephony is used, the subscriber uses the handset 37 for voice communications with the handset 37 being connected 60 Paging Services to the soundcard of the subscriber PC; otherwise, the handset is connected to the telephone subscriber line (which may be shared with the modem 36 for data).

If the checkbox 302 is not checked, the host services computer uses the Internet connection for control functions, 65 but establishes a voice connection via the conventional dialup telephone line. Normally, the host services computer

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is directed to forward calls to the number entered in the input box at 305 in FIG. 7 except when a time period specified by the four leftmost columns in the table at 310 is satisfied, in which case incoming calls are instead forwarded to the number in the associated right hand column.

The host services computer activates call forwarding by taking the line carrying the incoming call off-hook, sending the key sequence "#72" to the central office and, when dial tone is received from the central office, dialing the forwarding number previously entered by the subscriber on line 2. When the called number answers, call forwarding is activated; otherwise, if there is no answer or a busy signal, a dialog box (not shown in the drawings) is displayed on the subscriber's monitor (if active), asking the subscriber if the attempt to activate call forwarding should be attempted by redialing until canceled.

Message Routing

The subscriber may control the manner in which Email, voicemail and fax transmissions are handled using the form computer operates as a POP mailbox and SMTP server for receiving and sending email respectively. In order to coordinate email, voicemail and fax transmission, the host services computer may advantageously employ a set of conventional format conversion functions including: voice to text speech recognition for converting voice mail into text form suitable for transmission via email as well as by voice file MIME attachments to email; optical character recognition for translating fax transmissions into text form for email transmission as well as by MIME fax file attachments to email. The information provided on the form of FIG. 8, which is self explanatory, allows email, fax and voice mail messages to be forwarded, stored, and redirected in a variety of ways in response to option selections made by the

Similarly, the form seen in FIG. 9 provides a mechanism for establishing voice mail mailboxes and governing special functions performed by each. As seen at 286 in FIG. 6, incoming calls from persons or firms identified in the phone book database may be automatically routed to voice mailboxes designated using the form of FIG. 9. This form allows the subscriber to set a password or pin number (set and reset by pressing the button at 321), to automatically save and/or forward voice mail routed to this mailbox to specific directories or recipients, and to.

The voice mailbox form seen in FIG. 9 further displays a listing of all undeleted voicemail received by this mailbox, along with the date and time recorded and the identification of the caller. By pressing the hypertext link "Review" seen at 333 in FIG. 9, the host services computer sends the HTML page seen in FIG. 10 which displays the voice recognized text of the selected message at 340 and enables the subscriber to control the audio playback of the message using the HTML buttons seen at 342. In addition, the form seen in FIG. 10 enables the subscriber to save the voice mail message as an audio file or send it to as a voice file MIME attachment to email. Similarly, the voice recognized text may be edited by the user using the memo form at 340, and saved or sent as an email attachment.

The subscriber may select the hypertext link option 400 seen on the main menu of FIG. 2 to display a form as seen in FIG. 11 to control paging services. The subscriber enters the phone number of his or her paging service (see 85 in FIG. 1) in the input line box at 422. Using the checkboxes and radio buttons provided on the form of FIG. 11, the subscriber may designate the conditions under which auto-

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matic paging is to occur when incoming voice, fax and email messages are received. The form of FIG. 11 also displays a history list of prior automatically generated paging messages for review by the subscriber using the web connection. Voice and DTMF Controls

In order to control the host services computer using nothing but a conventional telephone stationset, such as the telephone 38 or 81 seen in FIG. 1, conventional voice command interpreters and dialtone control mechanisms may be employed. These techniques, now in common use in 10 voicemail systems, may be implemented using voice command interpretation and speech recognition software components available from Pure Speech Corp. One widely used voice controlled telephone systems which has enjoyed considerable success is the Wildfire System offered by Wildfire 15

In addition to the hardware interface products offered by Dialogic, the Generations TSP system marketed by Voicetek Corp., 19 Alpha Rd., Chelmsford, Mass. provides a telephony server platform that bridges telecommunications and 20 mixed-media information processing networks, linking different communications tools including telephones, computers, faxes, speech recognition and speech synthesis components, and providing services for telephony sequencing, physical interfacing activities and telephony 25 functions.

Speech synthesis programs which may be employed to convert text to speech for replay over the telephone voice connection include: ProVoice (V.2.1)/PrimoVox marketed by First Byte (subsidiary of CUC International, Inc.), 19840 30 selectively recording voice mail messages includes the step Pioneer Ave. Torrance, Calif. 90503, which enables programmers to add synthesized speech to applications, analyzes and translates text into sound descriptors, phonetic language with pitch, duration and amplitude codes needed to speech synthesis product which may be employed is Vox-Fonts (V.1.0) sold by Voice Information Systems, Inc., 2118 Wilshire Blvd., Ste. 973, Santa Monica, Calif. 90403, which provides a text-to-speech synthesis library of programs that translates ASCII text into digital audio file, supporting 40 message designated by said selection. Dialogic and other industry standard formats and uses concatenated human speech for natural sound, and allows the user to add translation rules or specify pronunciations for difficult or foreign words.

Software components for handling Fax-To-Voice transla- 45 tion are available from Malibu Software Group, Inc., 23852 Pacific Coast Hwy., Ste. 909, Malibu, Calif., which faxed document to be converted into spoken words. This fax to voice system provides the ability to receive and store fax documents in user's mailbox similar to regular voice mail 50 messages, and incorporates mechanisms for providing security and control of information. Can be integrated with other voice mail systems.

In general, using conventional speech and command recognition, DTMF tone signaling detection, and speech 55 said preference data. synthesis techniques for sending voice prompts and information to the user, all of the control functions discussed in detail above using the HTML/CGI interface may be replicated using voice controls via the telephone line, permitting the host services computer to be controlled using either the 60 website or the voice interface. Nonetheless, because voice prompts must be presented sequentially and voice response interpretation is similarly cumbersome in many cases, the web interface contemplated by the present invention provides a preferred control mechanism for many functions.

It is to be understood that the embodiment of the invention which has been described is merely illustrative on one

application of the principles of the invention. Numerous modifications may be made by those skilled in the art without departing from the true spirit and scope of the invention.

What is claimed is:

- 1. The method of processing telephone calls on behalf of a subscriber which comprises, in combination, the steps of: connecting a web browser accessible to said subscriber to the Internet.
 - connecting a web server to the Internet at a location remote from said web browser,
- employing said web browser to submit preference data to said web server via the Internet, said preference data defining the manner in which said subscriber desires to have telephone calls processed,
- storing said preference data as submitted in a database, employing call processing apparatus coupled to said database and to the public switched telephone network for receiving incoming telephone calls directed to said subscriber from said public switched telephone network.
- employing said call processing apparatus to forward said incoming telephone calls to one or more telephone numbers designated by said preference data via said public switched telephone network, and
- selectively recording voice mail messages from persons originating said incoming telephone calls in a manner specified by said preference data.
- 2. The method set forth in claim 1 wherein the step of of recording voice mail messages from the originators of incoming calls from selected ones of a set of telephone numbers specified by said preference data.
- 3. The method set forth in claim I further including the produce stress patterns in phrases and sentences. A second 35 step of transmitting a listing of said voice mail messages to a remote user from said web server, employing said web server to accept a selection of one of said voice mail messages from said remote user, and thereafter transmitting to said remote user an audio file containing the voice mail
 - 4. The method set forth in claim 1 further including the step of employing voice recognition means for translating a selected one of said voice mail messages into a file of text data and for transmitting said file of text data to a destination in a manner specified by said preference data.
 - 5. A The method set forth in claim 4 wherein said file of text data is transmitted in an email message to an email address specified in said preference data.
 - The method set forth in claim 1 wherein at least some of said incoming telephone calls are facsimile transmissions and wherein the step of employing said call processing apparatus to forward said incoming telephone calls includes the step of converting said content into a MIME file attachment transmitted by email to an email address specified by
 - 7. The method set forth in claim 1 wherein at least some of said incoming telephone calls are facsimile transmissions and wherein the step of employing said call processing apparatus to forward said incoming telephone calls further includes the steps of establishing a voice mailbox storage system for storing messages recorded by the originators of said incoming calls, employing fax-to-voice means for converting the content of specified ones of said fax messages into voice data, and storing said voice data in said voice 65 mailbox storage system.
 - 8. The method set forth in claim 1 wherein at least some of said incoming telephone calls are facsimile transmissions

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and wherein the step of employing said call processing apparatus to forward said incoming telephone calls further includes the steps of employing character recognition means for converting the content of specified ones of said fax designated destination in a manner designated by said preference data.

9. The method set forth in claim 8 wherein said step of transmitting said text data comprises transmitting said text specified by said preference data.

10. The method set forth in claim 1 further comprising the step of transmitting a paging message to said subscriber upon the receipt of selected incoming calls in a manner specified by said preference data.

11. The method set forth in claim 1 further including the step of establishing a voice connection via the Internet for 16

forwarding at least some of said incoming calls to a designated computer in a manner specified by said preference

12. The method set forth in claim 11 further including the messages into text data and transmitting said text data to a 5 step of first attempting to forward at least given ones of said incoming calls via an Internet connection to a designated computer accessible to said subscriber and, when said Internet connection is unavailable, forwarding said given ones of said incoming calls via the public switched telephone netdata in the content of an email message to an email address 10 work to one or more telephone numbers as specified by said preference data.

13. The method set forth in claim 1 wherein said step of forwarding said incoming calls further comprises the step of altering the forwarding destination for said incoming calls at 15 chronological times specified by said preference data.

ABS00001038

EXHIBIT 4

(12) United States Patent

Nagai et al.

(10) Patent No.:

US 6,636,587 B1

(45) Date of Patent:

Oct. 21, 2003

INFORMATION RECEPTION PROCESSING METHOD AND COMPUTER-TELEPHONY INTEGRATION SYSTEM

- Inventors: Yasuhiko Nagal, Tokyo (JP); Susumu Matsui, Machida (JP)
- (73) Assignee: Hitachi, Ltd., Tokyo (JP)
- Subject to any disclaimer, the term of this (*) Notice: patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
- (21) Appl. No.: 09/103,816
- (22)Filed: Jun. 24, 1998
- (30)Foreign Application Priority Data
- (51) Int. Cl.⁷ H04M 11/00
- 379/118; 379/142.14; 379/88.06; 379/88.25 370/352, 356. Field of Search 370/401, 270; 379/88.06, 88.25, 93.11, 87, 142.14, 88.13, 88.14, 88.17, 88.18, 88.19, 88.22, 88.23, 100.03, 118, 67.1,

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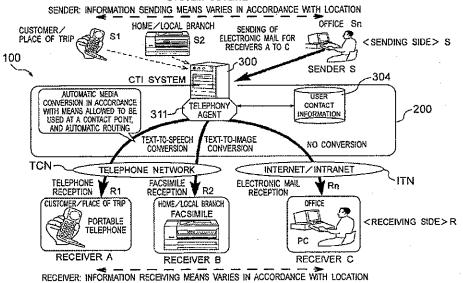
Primary Examiner-Fan Tsang Assistant Examiner-S. P. Singh (74) Attorney, Agent, or Firm-Antonelli, Terry, Stout & Kraus, LLP

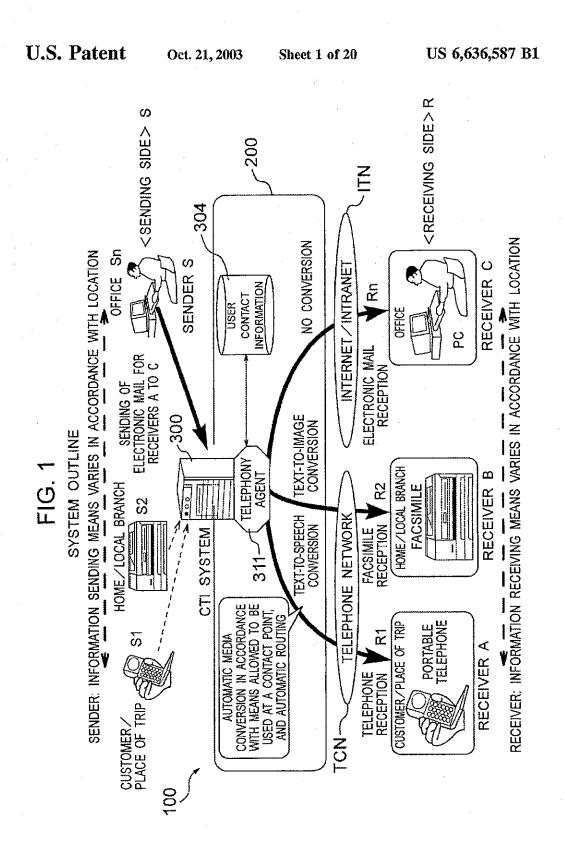
ABSTRACT (57)

When a sender sends a transmission message to a receiver by use of a communication appliance such as telephone, portable telephone, facsimile or electronic mail, the transmission massage is temporarily received by a computertelephony integration (CTI) server. The CTI server makes reference to a user contact table to thereby specify a contact point of the receiver at present and the kind of a communication appliance capable of being used by the receiver which are registered in advance in the user contact table. Then, the CTI server sends the transmission message to the receiver after automatic media conversion in accordance with the communication appliance and reception condition which are allowed for the receiver to use. A reception condition requested by the sender may be reflected in a part of the reception condition of the receiver.

20 Claims, 20 Drawing Sheets

SYSTEM OUTLINE





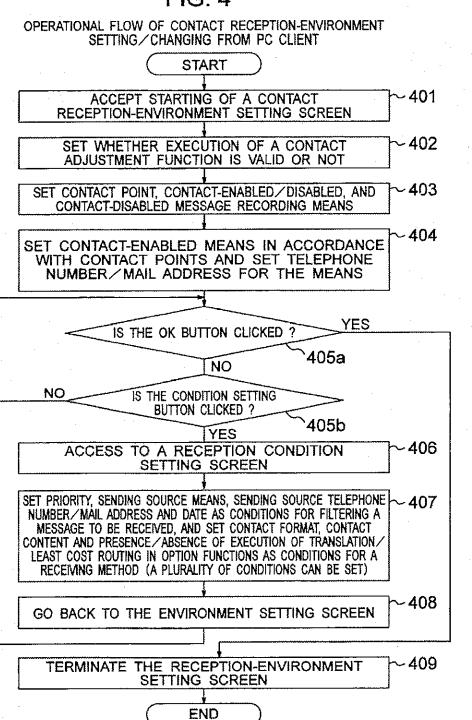
U.S. Patent US 6,636,587 B1 Oct. 21, 2003 Sheet 2 of 20 TELEPHONE FACSIMILE 215 200 OFFICE TELEPHONE INTERNET FACSIMILE PC CLIENT FIG. 2 SYSTEM CONFIGULATION OF CTI 207 204 CTI SERVER BUSINESS APPLICATION SERVER 202 TELEPHONE NETWORK POCKET BELI TEL EPHONE PC CLIENT

U.S. Patent US 6,636,587 B1 Oct. 21, 2003 Sheet 3 of 20 PBX/ACD N S ~ 300 319 305 303 308 307 ASR PROCESSING BOARD 301 CHARACTER RECOGNITION PROCESSING BOARD ITS PROCESSING BOARD VOICE / FACSIMILE USER CONTACT INFORMATION DATABASE PBX INTERFACE LAN INTERFACE WORK MEMORY Spu SYSTEM CONFIGURATION OF CTI SERVER SYSTEM EXECUTION MANAGEMENT **PROGRAM** VR PROGAM
VOICE RECOGNITION PROCESS (ASR)
VOICE SYTHESIS PROCESS (TTS)
CHARACTER RECOGNITION PROCESS
LANGUAGE TRANSLATION PROCESS
VOICE / FACSIMILE INFORMATION INQURY PROCESS
TRANSMISSION MESSAGE PROCESS 317 CONTACT POINT/CONDITION SETTING AND CHANGING PROCESS CONTACT CONDITION ADJUSTMENT PROCESS (INCLUDING INTERNET SERVER CONTROL PROGRAM (INCLUDING INTERNET TELEPHONE / FAXGW) PBX/ACD CONTROL PROGRAM (INCLUDING ANI/DNIS) GROUPWARE CONTROL PROGRAM BUSINESS APPLICATION CONTROL PROGRAM CONTACT POINT/MEANS/CONDITION SPECIFYING (INCLUDING TEXT-TO-CODE, TEXT-TO-IMAGE AND FACSIMILE CONTROL PROGRAM PROGRAM MEMORY ROUTING EXECUTION CONTROL PROCESS TELEPHONY AGENT PROGRAM MAGE-TO-TEXT CONVERSION) CONTACT MANAGER PROGRAM MEDIA CONVERSION) 309 310 313 314 316 318-311

Oct. 21, 2003

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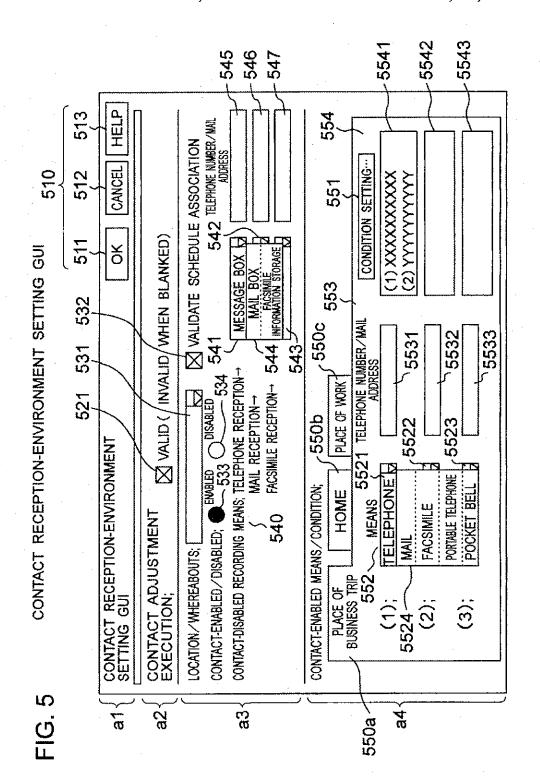
FIG. 4



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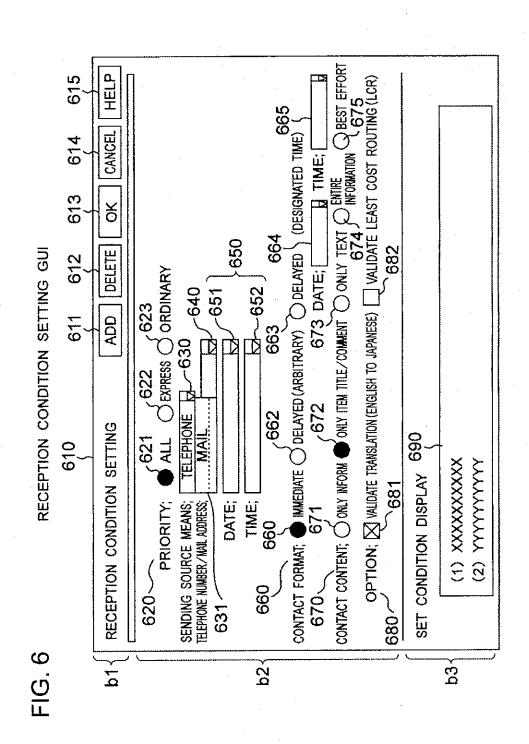
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U.S. Patent US 6,636,587 B1 Oct. 21, 2003 Sheet 7 of 20 \sqrt{N} CONTACT-ENABLED MEANS/ CONTACT POINT/CONDITION C-ccc **BB22** PORTABLE TELEPHONE MEANS FACSIMILE MAIL MESSAGE QQ11 QQ22 22-0 MEANS CONTACT 707 USER CONTACT INFORMATION TABLE ENABLED MESSAGE BOX MAIL PLACE ENABLED OF WORK CUSTOMER ENABLED 706 HOME 705 VALID VALID VALID 704 A-aaa B-bbb ر ارد دود 703 OPENED MAIN TELEPHONE NUMBER BB11 CC11 **AA11** NAME ∢ œ O USER NUMBER 7011 700 2 ന

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U.S. Patent US 6,636,587 B1 Oct. 21, 2003 Sheet 8 of 20 8083g NONE NONE ENTRE NONE 8083f BEST EFFORT IMMEDIATE EFFORT DESIGNATED DELAYED 8083e DELAYED DATE 8083d ALL ALL ALL CONTACT-CONDITION SOURCE MEANS TELEPHONE NUMBER/ADDRESS 8083 ALL ALL ALL 8083c 8083b ALLALL 8083a PRIORITY EXPRESS ALL AL AL AA33 8082 A-aaa **AA22** PORTABLE TELEPHONE FACSIMILE MAIL 8081 NAME CUSTOMER HOME PLACE OF WORK 8011

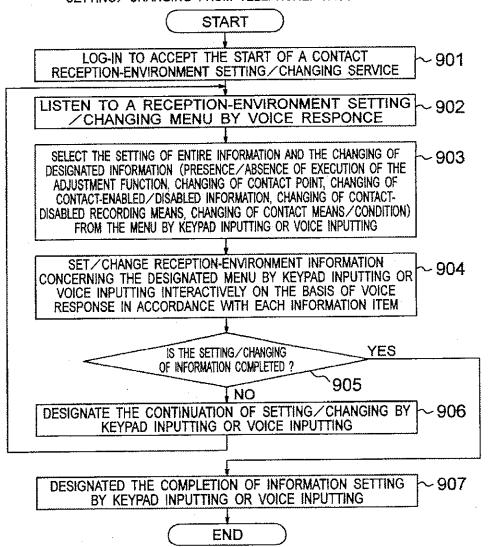
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FIG. 9

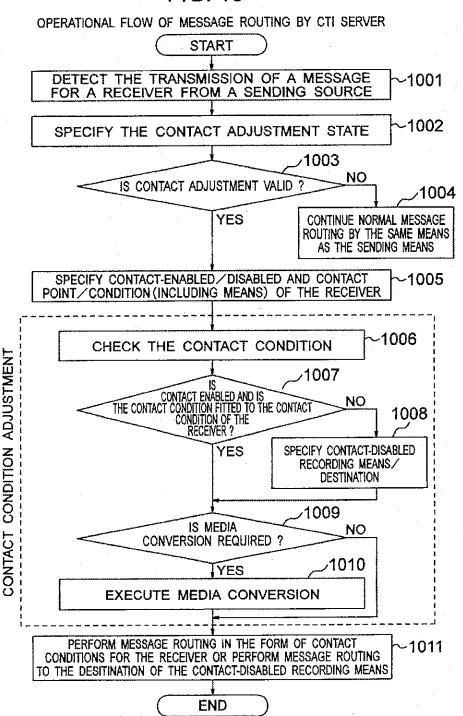
OPERATIONAL FLOW OF CONTACT RECEPTION-ENVIRONMENT SETTING/CHANGING FROM TELEPHONE/FACSIMILE



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FIG. 10



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COMMENT (LEVEL B)

LIMITATION OF TRANSFER CONTENT BASED ON DIFFERENCE IN SENDING/RECEIVING MEANS

<u> ∞ ≅</u>	RECEIVING SENDING MEANS MEANS	TELEPHONE / PORTABLE TELEPHONE	MAIL	FACSIMILE	POCKET BELL
	TELEPHONE / PORTABLE TELEPHONE	ш	Ш	Q	В
	TEXT MAIL	D		Q .	В
MAIL	VOICE MAIL	Ш	Ш	Q ·	8
	FACSIMILE MAIL	D		Ш	83
, ,	FACSIMILE	Q	Ú	Ш	8
<u>"</u>	EVEL OF LIMIT	ATION: ONLY INF	LEVEL OF LIMITATION: ONLY INFORM (LEVEL A)		

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POCKET BELL	VOICE-TO- POCKET BELL CODE CONVERSION	TEXT-TO- POCKET BELL CODE CONVERSION	VOICE-TO- POCKET BELL CODE CONVERSION	IMAGE-TO- POCKET BELL CODE CONVERSION	IMAGE-TO- POCKET BELL CODE CONVERSION
FACSIMILE	VOICE-TO-IMAGE CONVERSION	TEXT-TO-IMAGE CONVERSION	VOICE-TO-IMAGE CONVERSION	CONVERSION NOT REQUIRED	CONVERSION NOT REQUIRED
MAIL	VOICE MAIL	CONVERSION NOT REQUIRED			FACSIMILE
TELEPHONE / PORTABLE TELEPHONE	CONVERSION NOT REQUIRED	TEXT-TO-VOICE CONVERSION	CONVERSION NOT REQUIRED	IMAGE-TO-VOICE CONVERSION	IMAGE-TO-VOICE CONVERSION
RECEIVING MEANS SENDING MEANS MEANS	TELEPHONE / PORTABLE TELEPHONE	TEXT MAIL	VOICE MAIL	FACSIMILE	FACSIMILE

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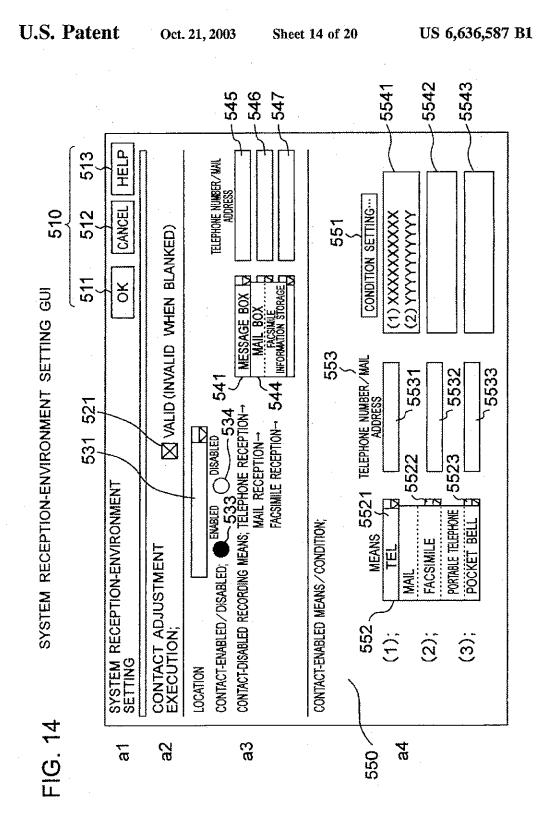
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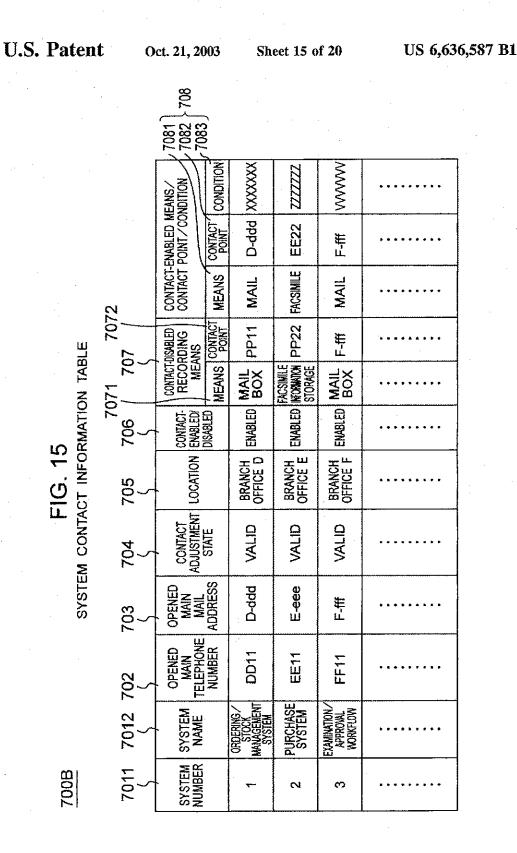
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DESIGNATED TIME	TRANSFER AT A DESIGNATED TIME AFTER STORAGE IN A VOICE DATABASE	TRANSFER AT A DESIGNATED TIME FROM A GROUPWARE SERVER	TRANSFER AT A DESIGNATED TIME AFTER STORAGE IN A FACSIMILE DATABASE	NONE
DELAYED	NONE	TRANSFER DIRECTLY	NONE	NONE
IMMEDIATE	TRANSFER	NONE	TRANSFER	TRANSFER
CONTACT FORMAT RECEIVING MEANS	TELEPHONE / PORTABLE TELEPHONE	MAIL	FACSIMILE	POCKET BELL

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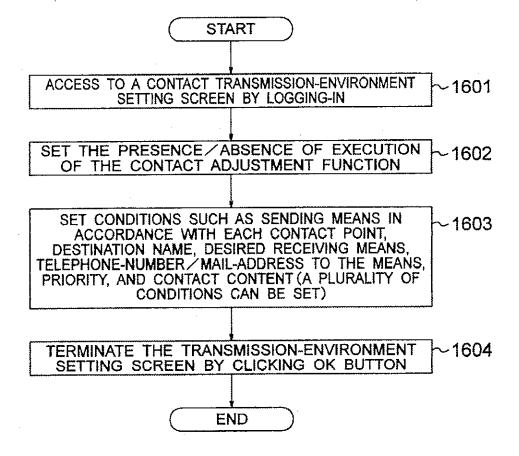
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FIG. 16

OPERATIONAL FLOW OF CONTACT TRANSMISSION-ENVIRONMENT SETTING/CHANGING FROM PC CLIENT



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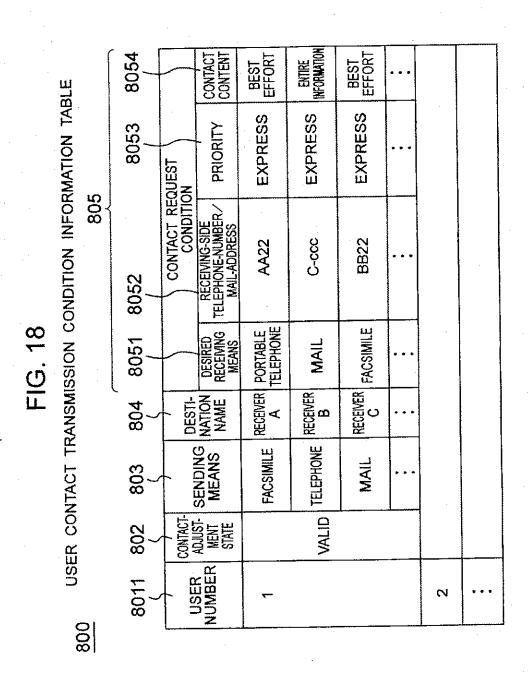
U.S. Patent US 6,636,587 B1 Oct. 21, 2003 Sheet 17 of 20 815 CANCEL 814 813 810 숭 CONTACT TRANSMISSION-ENVIRONMENT SETTING GUI 812 ADD ONLY ITEM TITLE/COMMENT 811 832 833 CONTACT TRANSMISSION-ENVIRONMENT SETTING ORDINARY X VALID (INVALID WHEN BLANKED) CONTACT TRANSMISSION ADJUSTMENT EXECUTION; .860 CONTACT CONTENT CONLY INFORM (TRANSMISSION REQUEST CONDITION; 841 EXPRESS TELEPHONE-NUMBER/MAIL-ADDRESS; (1) WWWWWW Z Z Z Z Z SET CONDITION DISPLAY SENDING MEANS; TRANSMISSION DESTINATION NAME; DESIRED RECEIVING MEANS; $\dot{\aleph}$ Ŕ 8

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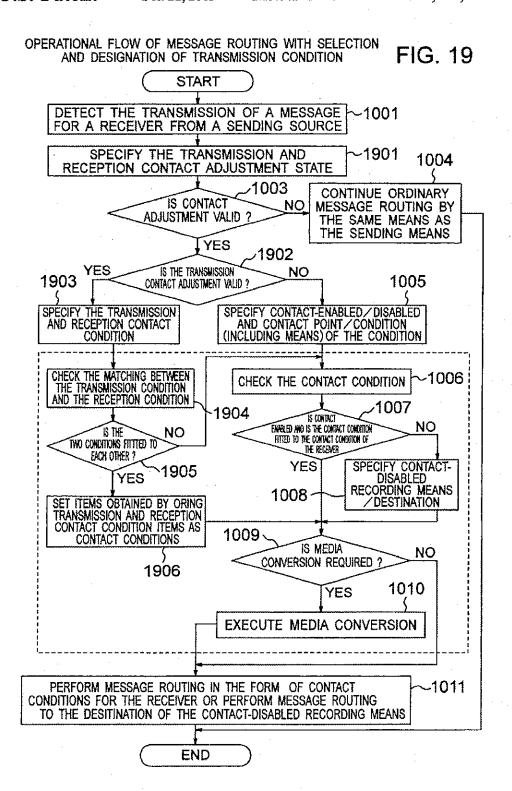


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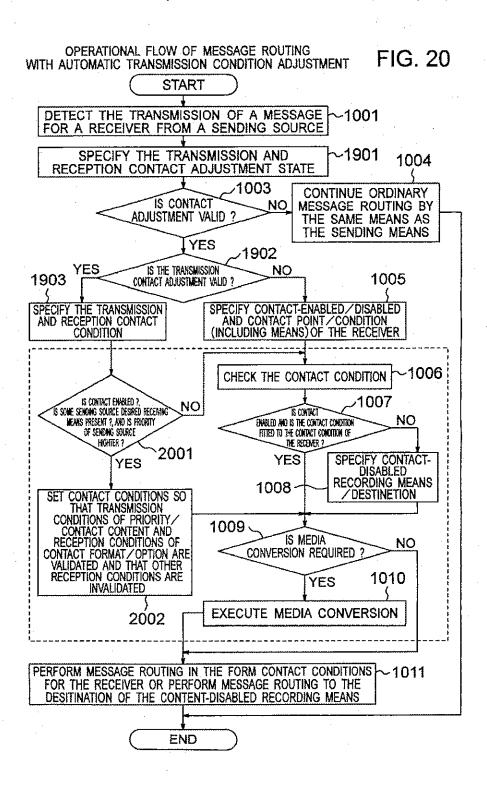
(Page 21 of 43)

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INFORMATION RECEPTION PROCESSING METHOD AND COMPUTER-TELEPHONY INTEGRATION SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to a computer-telephony integration system (hereinafter referred to as "CTI system") and an information reception processing method to provide an information processing environment for integrating communications with a computer, and particularly relates to a CTI system and an information reception processing method in which information (e.g. multimedia information with voice, text and image) sent from a transmitter side by an arbitrary information transmission means can be automatically converted and transmitted to a connection destination allowed to receive the information by a receiving-side subject in accordance with the reception environment in the connection destination.

In recent years, a CTI system for integrating a telephone with a computer has been demanded under an environment of call center, office, SOHO (Small Office Home Office), virtual enterprise, CALS (Commerce At Light Speed), or the like. Under the aforementioned environment, the CTI system uses multimedia information (e.g. voice, text and image) to construct an effective and efficient communication environment by using a multimodal communication means such as a telephone, a facsimile equipment or a personal computer or to construct an effective and efficient work aiding environment for associating a telephone system with a work system such as a groupware system or a business application by the multimodal communication means. For example, in call center work or office work, such a CTI system has been demanded for integrating computer processing with a conventional telephone system to aid work information with use of the telephone system or for associating one information system with another information system to aid integrated information of a system under an internet/intranet environment and the conventional telephone system to thereby attain improvement in work efficiency and customer's satisfation.

Incidentally, as a conventional techniques of this type, there is a unified messaging technique in which communication means using various media such as voice, text and image information from various information appliances such as a telephone, facsimile equipment and a personal computer are unified in order to improve communication efficiency in office or SOHO. The technique is described in Workgroup Computer Report Vol. 19, No. 4, 1996, pp.12-17 and U.S. Pat. No. 5,524,137.

As another conventional technique, there is a telephony agent technique in which a person in charge of call center work in the past or a person having skill in call center work is automatically specified as a destination of telephone call 55 by computer processing so that improvement in work efficiency and customer's satisfication is attained by automatic acceptance/transfer and reduction of human load in a great deal of telephone calls occurring in call center work. The technique is described in Workgroup Computing Report Vol. 60 19, No. 4, 1966, pp.18-21.

However, the aforementioned conventional techniques merely control a destination of connection but do not control the manner of transmission of information in accordance with the reception environment on the destination of con- 65 nection. There arises therefore a problem that user's transmission/reception of information can be performed

only by a transmission/reception means designated on the system in advance and that a user is not allowed to select a contact means freely. As a result, the CTI technique and the unified messaging technique having association with groupware have not achieved any situation in which a user is allowed to have effective use of a communication environment that the user can use various connection means such as a telephone, facsimile equipment and a personal computer and various media such as voice, text and image.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an information reception processing method and a computertelephony integration system in which transmission control can be performed in accordance with the information reception environment of a receiving-side subject when multimedia communication information is transmitted from a sending-side subject to the receiving-side subject.

Another object of the present invention is to provide a recording medium on which programs and data to be used in the above-mentioned information reception processing method and computer-telephony integration system are recorded.

In order to achieve the above objects, according to an aspect of the present invention, there is provided an information reception processing method for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, the method comprising the steps of: preliminarily registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of the means allowed to receive information, and receptioncondition information for indicating a condition of information reception at the contact point, in accordance with an original destination in each of receiving-side subjects of information reception; and performing contact adjustment by referring to the reception-environment information when information destined for any one of the receiving-side subjects arrives to thereby acquire the contact-enabledmeans information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not the arrived information satisfies a reception condition indicated by the receptioncondition information of the receiving-side subject, and converting the arrived information so as to satisfy the reception condition when the reception condition is not satisfied and transmitting the converted information to the contact point.

According to another aspect of the present invention, there is provided a computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, the system comprising: a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contactpoint information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at the contact point, in accordance with an original destination in each of receiving-side subjects of information reception; and contact adjustment means for performing contact adjustment by referring to the reception-

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environment information when information destined for any one of the receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receivingside subject, making judgment as to whether or not the arrived information satisfies a reception condition indicated by the reception-condition information of the receiving-side subject, and converting the arrived information so as to satisfy the reception condition and transmitting the converted information to the contact point.

For example, the aforementioned reception-environmentinformation registration means may include storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of the system.

Here, preferably, the aforementioned means for accepting a reception-environment-information setting operation has a function for displaying a reception-environmentinformation setting screen to carry out the receptionenvironment-information setting operation, a function for accepting an input in accordance with the screen, and a function for making the storage means store receptionenvironment setting data set by the accepted input.

Preferably, the function for displaying a receptionenvironment-information setting screen displays a screen on which at least contact-enabled-means information and contact-point information can be inputted.

Further, the system may further comprise transmissionenvironment-information registration means for setting a condition of a request for reception in the information 30 sending side with respect to every original destination in each of the receiving-side subjects.

Here, the transmission-environment-information registration means may include a storage means for storing transmission-environment information, and means for 35 accepting a transmission-environment-information setting operation from the outside of the system.

According to a further aspect of the present invention, there is provided a recording medium for recording a program to be executed by a computer to transmit informa- 40 tion from an arbitrary information sending source to a specific receiving-side subject which is a destination of the information transmission, wherein the program is to be executed by the computer in a manner so that the computer performs processing of: preliminarily registering reception- 45 environment information including, at least, contactenabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of the means allowed to receive information, and reception-condition information for indicating a condition of information reception at the contact point, in accordance with an original destination in each of receiving-side subjects of information reception; and performing contact adjustment by referring to the receptionenvironment information when information destined for any 55 one of the receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receivingside subject, making judgment as to whether or not the arrived information satisfies a reception condition indicated 60 by the reception-condition information of the receiving-side subject, and converting the arrived information so as to satisfy the reception condition when the reception condition is not satisfied and transmitting the converted information to the contact point.

For example, the reception-environment-information registration may contain a process for storing reception-

environment information, and a process for accepting a reception-environment-information setting operation from the outside of the system.

The process for accepting a reception-environmentinformation setting operation may contain a process for displaying a reception-environment-information setting screen to carry out the reception-environment-information setting operation, a process for accepting an input in accordance with the screen, and a process for making the storage means store reception-environment setting data set by the accepted input.

The process for displaying a reception-environmentinformation setting screen may display a screen on which at least contact-enabled-means information and contact-point information can be inputted.

The function for displaying a reception-environmentinformation setting screen displays a screen on which information for indicating whether the information can be received on the receiving side or not, and information for indicating a storage means for recording the sent information when reception is disabled, can be further inputted.

The program may further contain a communication means for performing data communication with an information processing apparatus in the outside of the system, and the process for accepting a reception-environment-information setting operation may contain a process for transmitting programs and data to a requester through the communication means to carry out the process for displaying a receptionenvironment-information setting screen and carry out the function for accepting an input in accordance with the screen when a reception-environment-information setting request is accepted from the outside of the system, and a process for receiving reception-environment setting data sent from the requester through the communication means and delivering the data to the function for making the storage means store

According to a still further aspect of the resent invention, there is provided a recording medium for recording a program to be executed by a computer for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, wherein the program contains: a program for specifying a sender of telephone or facsimile and sender information and controlling automatic call distribution; a program for controlling interactive voice response (IVR); a groupware program for achieving communication using voice, text and image information between apparatuses connected to a network; a contact manager program for registering and managing receptionenvironment-condition information containing, at least, contact-enabled-means information, contact-point information and reception-condition information with respect to a reception subject; and a telephony agent program for making reference to the reception-environment information at the time of arrival of information destined for a receiving-side subject to thereby acquire contact-enabled-means information and contact-point information in the receiving-side subject in the destination, judging whether the arrived information satisfies a reception condition indicated by the reception-condition information in the receiving-side subject, and converting the arrived information to satisfy the reception condition when the arrived information does not satisfy the condition.

As a more specific mode of the aforementioned computertelephony integration system according to the present invention, the following means may be used in combination.

Means (ANI: Automatic Number Identification/DNIS: Dialed Number Identification Service) for specifying sender and receiver information of telephone or facsimile, means (ACD: Automatic Call Distribution) for distributing call of telephone or facsimile automatically, means (IVR: Interac- 5 tive Voice Response) for performing automatic response by automatically recognizing voice information, for example, from telephone and converting the voice information into text information or converting text information into voice information for telephone, means for converting image 10 information, for example, from facsimile into image information or converting text information into image information for facsimile, means for sending/receiving text-format electronic mail as a message, means for unified messaging for multimedia electronic mail, desirably, such as voice mail, 15 client side; facsimile mail and text mail, means for registering; managing location/contact-point information for another system newly and additionally associated with the means for registering/managing location/contact-point information for a user's system, means for registering and holding a receiver 20 contact condition containing at least two requisites among the requisites consisting of propriety of contact, contactenabled means, priority, connection format, used language, contact content, and transfer route only on the receiving side or independently both on the sending side and on the 25 receiving side or selectively from the receiving side condition on the sending side, and a telephony agent means for routing information by specifying a contact point at which a user can receive the information at the time of reception of telephone, facsimile or electronic mail destined for the user; 30 and performing media conversion and condition adjustment automatically on the basis of a contact condition in which the user can receive the information

BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 is an explanatory view showing the outline of a system to indicate the schematic characteristic of the present
- FIG. 2 is an explanatory view showing an example of the schematic system configuration of a CTI system according 40 to the present invention;
- FIG. 3 is a block diagram showing an example of the system configuration of a CTI server system according to the present invention;
- FIG. 4 is a flow chart showing the operation of setting/ 45 changing the contact reception environment from the PC client side;
- FIG. 5 is an explanatory view showing an example of a scene for the operation of setting/changing the contact reception environment from the PC client side;
- FIG. 6 is an explanatory view showing an example of a scene for the operation of setting/changing the reception condition from the PC client side;
- FIG. 7 is an explanatory view showing an example of a user contact information table;
- FIG. 8 is an explanatory view showing an example of a user location contact condition information table on which contact conditions in each user are classified by location;
- changing the contact reception environment from the telephone/facsimile side;
- FIG. 10 is a flow chart showing the operation of routing a message in a CTI server according to the present invention;
- FIG. 11 is an explanatory view showing limitation in the 65 content of contact on the basis of a difference in transmission/reception means;

- FIG. 12 is an explanatory view showing correspondence in classification of media conversion on the basis of a difference in transmission/reception means;
- FIG. 13 is an explanatory view showing correspondence in classification of processing on the basis of reception means and contact format;
- FIG. 14 is an explanatory view showing an example of a scene for the operation of setting/changing the system reception environment;
- FIG. 15 is an explanatory view showing a system contact information table;
- FIG. 16 is a flow chart showing the operation of setting/ changing the contact transmission environment from the PC
- FIG. 17 is an explanatory view showing an example of a scene for the operation of setting/changing the contact transmission environment from the PC client side;
- FIG. 18 is an explanatory view showing a user contact transmission condition information table on which contact transmission conditions are classified by user;
- FIG. 19 is a flow chart showing the operation of routing a message in the case where the transmission condition selection is designated; and
- FIG. 20 is a flow chart showing the operation of routing a message in the case where the transmission condition is controlled automatically.

DESCRIPTION OF THE PREFERRED **EMBODIMENTS**

Embodiments of the present invention will be described below with reference to the drawings.

Referring now to FIGS. 1 through 3, an embodiment of the present invention will be described.

The schematic characteristic of a CTI system 100 according to the present invention is shown in FIG. 1. The CI'I system 100 uses various communication means such as a telephone, a facsimile equipment and a personal computer (PC) to give a user a communication environment in which multimedia information such as voice, text and image is allowed to be exchanged and in which information transmission is hardly limited regardless of difference in information transmission/reception means and regardless of difference in information expression format between the information transmission side and the information reception side. Hence, this CTI system 100 is provided between a subject of information sending side (hereinafter sometimes simply referred to as "sending side") S and a subject of information receiving side (hereinafter simply referred to as 'receiving side") R as shown in FIG. 1.

This CTI system 100 routes information from the sending side S to the receiving side R, that is, sets a path for information transmission so that a contact means, for 55 example, Rn, allowed to be used is selected from contact means R1, R2, . . . Rn which are means for information reception on the receiving side R. When the expression format of information on the sending side S is different from the expression format of information on the receiving side R, FIG. 9 is a flow chart showing the operation of setting/ 60 this CTI system 100 further converts the expression format automatically so that information on the sending side S can be used by the receiving side R. This is for the purpose of eliminating limitation that information cannot be received because there is generally difference in the expression format of information between media when the medium used on the sending side S and the medium used on the receiving side R are different from each other. When there is Case 1:07-cv-00090-SLR

a difference between media corresponding to the two sides, such as a telephone and a facsimile equipment, a telephone and a personal computer, or a facsimile equipment and a personal computer, there is a difference between the expression formats of information used in the corresponding two media, such as voice and image, voice and text, or image and text. When the expression format of information used in one medium is different from the expression format of information used in the other medium as described above, the expression format in one medium is required to be converted 10 telephone line 208 to thereby provide means in which a user into the expression format in the other medium.

For convenience of description, conversion of the expression format of information between different media may be called not only "information expression format conversion" but also "media conversion" in this specification. In this 15 embodiment, media conversion or expression format conversion mainly means the conversion of the expression format of information between different kinds of media. The present invention is, however, not limited thereto. For example, media conversion or expression format conversion 20 may contain the conversion of the expression format of information between media of the same kind. For example, media conversion may contain the conversion of the expression format of information when word processing software programs of different kinds or word processing software of 25 the same kind but different versions are used so that information cannot be transmitted or cannot be read because of difference in the expression format in spite of information transmission media of the same kind.

To perform the aforementioned routing and media conversion and perform registration therefor, this CTI system 100 has a CII server 300 having a telephony agent program 311, and a contact manager program 312 (see FIG. 3). Further, the CTI server 300 includes a user contact information database 304 used in routing and media conversion 35 as will be described later.

FIG. 2 is a configuration diagram of an embodiment in which the CII system 100 according to the present invention is applied to an office 200. In the embodiment shown in FIG. $_{40}$ 2, the CTI server 300 is connected to various information processing apparatuses in the office 200 through a local area network (LAN) 207 and connected to a telephone switchboard (PBX/ACD) 202 for perform communication with the outside. Further, the CTI server 300 can be connected to 45 external apparatuses through internet ITN. Incidentally, in the embodiment shown in FIG. 2, the CII server 300 is connected to internet ITN through an internet server 205 which will be described later. Configuration may be made so that the CTI server 300 can be connected directly to internet 50

The telephone switchboard (PBX/ACD) 202 is an automatic call distribution telephone switchboard having a function for performing switching control of in-bound call from a telephone network TCN to the CTI server 300 and out- 55 mounted for performing specific processing, for example, bound call from the CTI server 300 to the telephone network TCN and an automatic call distribution function for distributing call automatically. A telephone 210 and a facsimile equipment 211 as other apparatuses in the office than the CTI server 300 are connected to the telephone switchboard 202 60 executing voice synthesis processing at a high speed by through telephone line 208.

In the office 200 shown in FIG. 2, a groupware server 203 for providing a unified messaging service for unified messaging of voice, text and facsimile mail and a workflow management service of a work process, a business applica- 65 tion server 204 for providing a basic work processing service and an internet server 205 for providing an internet

service such as WWW, internet telephone and facsimile are provided as other apparatuses connected to the LAN 207 than the CTI server 300. The CTI server 300 provides an information processing service using combination of telephone processing and computer processing in association with the server group and the PBX/ACD.

Further, PC clients 209 are provided in the office 200. The PC clients 209 are connected to the server group through the LAN 207 and connected to the PBX/ACD 202 through the in the office sends/receives information.

On the other hand, in the outside of the office 200, respective development of external offices 100a and 100b which are virtual offices such as a customer office, a satellite office, a business partner office, a mobile office (outdoor), a small office (small-scale branch office, store or business office) and a home office (indoor), is assumed. Apparatuses which can be used by a user in the external office 100a are, for example, a PC client 213, a telephone 214 and a facsimile equipment 215 as apparatuses which can serve as means for sending/receiving information through internet ITN. Further, apparatuses which can serve as means in which a user in the external office 100b transmits/receives information through the telephone network TCN are, for example, a PC client 216, a telephone 217, a facsimile equipment 218, a portable telephone 219 and a pocket bell 220. Incidentally, classification into the external offices 100a and 100b is for the sake of convenience and not limited thereto. Further, apparatuses which can be used in the respective external offices 100a and 100b are shown by way

As described above, in the CTI system 100 according to the present invention, not only telephone but also various information transmission means such as internet and LAN are combined with a computer so that information from an arbitrary transmission means can be transmitted to an arbitrary receiving means.

FIG. 3 is a system configuration diagram of the CTI server 300 according to the present invention. The CTI server 300 has a PBX interface 301 for connection to the PBX 202, a LAN interface 302 for connection to the LAN 207 in the office, a voice/facsimile database 303 for storing voice or facsimile information, a user contact information database 304 for storing system user location/contact-point information and contact means and contact condition information, a work memory 305 for temporarily storing necessary information retrieved from the database 304 and serving as a work area for respective program processing, a program memory 318 for storing various programs, and a CPU 319 for performing access control to memory, database and board and executing respective programs.

Further, the CTI server 300 has various boards on which exclusive-use information processing apparatuses are actual processing for media conversion. That is, the CTI server 300 has a character recognition processing board 306 for executing character recognition processing at a high speed, a TTS (Text To Speech) processing board 307 for converting text information into voice information and an ASR processing board 308 for executing ASR (Automatic Speech Recognition) processing at a high speed for converting voice information into text information by voice recognition. These boards 306, 307 and 308 execute various kinds of processing concerning voice and character recognition processing under the control of an IVR (interactive voice

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response) program 310 which will be described later. Incidentally, boards which can be attached to the CII server 300 according to the present invention are not limited to these boards.

When the load on the CPU 319 is small, configuration 5 may be made so that all or part of the functions to be carried out by these exclusive-use processing boards can be executed by the CPU 319. In this case, a program therefor is added to the program memory 318.

For example, programs stored in the aforementioned 10 program memory 318 are, for example, a PBX/ACD control program 309 containing a sender and receiver information service (ANI/DNIS) of telephone and facsimile for controlling PBX/ACD, an IVR program 310 for voice recognition, voice synthesis, character recognition, language translation, 15 voice and facsimile information collation and massaging, a telephony agent program 311 for routing information by specifying a contact point, a contact means and a contact condition on the receiving side and adjusting the contact condition to convert the expression format of information 20 into an expression format according to the contact means on the receiving side, a contact manager program 312 for setting, changing and collating user contact information, a groupware control program 313 for performing control in association with the groupware server 203 through the LAN 207, an internet server control program 314 containing an internet telephone and facsimile gateway function for performing control in association with the internet server 205, a facsimile control program 315 for controlling facsimile in the office, a business application control program 316 for performing control in association with the business application server 204, and a system execution management program 317 for managing execution of the program group. Incidentally, programs installed in the CTI server 300 according to the present invention are not limited to these 35 programs.

These programs are executed by the CPU 319, by which various functions defined by the programs are achieved. Accordingly, processing is not achieved by the programs per se. In this specification, however, expression concerning the operation of the CPU 319 may be omitted for convenience of description as if various kinds of processing are achieved by the programs per se.

All or part of the aforementioned programs are recorded in a recording medium such as a CD-ROM so that they can be provided to the CII system 100. Further, all or part of the programs are stored, for example, in a hard disk device not shown. Further, the data structure of data used in the programs, that is, the data structure of data, for example, 50 generated or used in the contact manager program 312 and the telephony agent program 311 may be recorded in the aforementioned recording medium so as to be provided to the CII system. For example, this type data structure is shown typically in FIGS. 7, 8, 15 and 18 or FIGS. 11, 12 and 55

As described above, the telephony agent program 311 performs processing for routing information by specifying a contact point, a contact means and a contact condition on the receiving side and adjusting the contact condition to convert the expression format of information into an expression format according to the contact means on the receiving side. Accordingly, the telephony agent program 311 is executed by the CPU 319 to thereby achieve means for acquiring reception-enabled contact-point information in a receivingside subject by referring the reception-environment information at the time of arrival of information for the receiving-

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side subject, means for converting the arrived information to satisfy the reception condition indicated by the reception-condition information in the receiving-side subject when the arrived information does not satisfy the reception condition, and means for transmitting the converted information to the contact point on the basis of the acquired contact-point information. In specific functioning of these means, other hardware and software resources operate associatively. For example, for execution of media conversion, the aforementioned programs and boards 306, 307 and/or 308 may operate cooperatively. Further, in registration of the reception-environment information, the contact manager program 312, hardware and software resources for communication and an input device operate.

Ifor example, each of the voice/facsimile database 303 and the user contact information database 304 is constituted by a storage device such as a hard disk device. These databases 303 and 304 may be constituted by one and the same storage device.

The database 304 is used as a reception-environment-information registration means for registering reception-environment information containing, at least, contact-point information for indicating a contact point enabled to receive information in each receiving-side subject of information transmission, and reception-condition information for indicating how the contact point receives information. As a specific example, a user contact information table 700A shown in FIG. 7 and a user contact condition information table 800 shown in FIG. 8 are stored.

The user contact information table 700A shown in FIG. 7 contains, at least, contact-point information with respect to each user as a subject of reception. That is, user number 7011 and user name 7012 as a user identifier, opened main telephone number 702 as the number of an opened main telephone, opened main mail address 703, contact adjustment state information 704 for indicating whether adjustment for transmission of information to the receiving side is effective or not, location/whereabouts information 705 for indicating location or whereabouts of each user, contactenabled/disabled information 706 for indicating whether contact is enabled or not, contact-disabled recording means information 707 for indicating means for recording information to be received when information reception is impossible, and contact format information 708 for indicating the format of contact when contact is enabled, are stored in the user contact information table 700A. Recording means information 7071 for indicating recording means when contact is disabled, and contact-point information 7072 for indicating a contact point of the recording means, are stored in the contact-disabled recording means information 707. Contact means information 7081 for indicating contact-enabled means, contact-point information 7082 for indicating a contact point of the contact-enabled means, and contact condition information 7083 for indicating the condition of contact, are stored in the contact format informa-

The user location contact condition information table 800 shown in FIG. 8 is a table which defines contact format information classified by location of each user. In this table, contact formats with respect to at least one location can be defined. The contact formats can be registered in advance as will be described later, so that a contact condition registered in advance can be set in the user contact information table 700A shown in FIG. 7 by a simple operation of designating location or whereabouts.

Although FIG. 7 shows the case where the contents registered in the user location contact condition information

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table 800 shown in FIG. 8 are transferred to the user contact information table 700A, the present invention is not limited thereto. For example, a pointer for linking to a record of a location or contact point on the user location contact condition information table 800 shown in FIG. 8 may be stored in the contact format information 708 on the table 700A shown in FIG. 7 so that information per se is not transferred. Alternatively, for example, information stored in the location/whereabouts information 705 shown in FIG. 7 may be used as the aforementioned pointer. In this case, the 10 column of contact format information 708 can be eliminated from the table 700A shown in FIG. 7.

User number 801, location/whereabouts information 805 and contact format information 808 are registered in the user location contact condition information table 800 shown in 15 FIG. 8. The location/whereabouts information 805 can be provided correspondingly to location or whereabouts. The contact format information 808 can be recorded correspondingly to the location/whereabouts information 805. Various contact formats can be set in the contact format information 20 808 in accordance with the environment of each location or

As described above with respect to the table 700A shown in FIG. 7, contact means information 8081 for indicating contact-enabled means, contact-point information 8082 for indicating a contact point of each contact-enabled means and contact condition information 8083 for indicating the condition of contact are stored as the contact format informa-

The contact condition information 8083 contains: priority information 8083a for indicating priority in processing of a transmission message, for example, distinction between express mail and ordinary mail; sender means information 8083b for indicating information sending means on the sending side S; sender telephone number/address information 8083c for indicating the telephone number and/or mail address of the sender, date information 8083d for setting the date of reception of the transmission message; contact format information 8083e for indicating a timelike contact format in transfer of the transmission message, such as for example "immediate", "delayed" or "delayed for a designated time"; contact-content information 8083f for indicating the content of contact showing the degree of the content of information to be contacted (transferred), such as for example "only inform", "only item title or comment", "only text", "entire information" or "best effort"; and option setting information 8083g for setting various options, such as for example "translation effectuation" and "costminimized routing effectuation". The "ALL" set on the table of FIG. 8 shows that any condition allowed to be set in the item can be applied. In the example of FIG. 8, option setting information is designated as "None" showing the state in which no option is set.

An example of the operation of the CTI system according 55 to the present invention will be described below with reference to FIGS. 1 through 13. Classifying roughly, the CTI system performs a process of setting or changing contact reception-environment information as a preparatory process and a contact state adjustment process at the time of 60 reception of information. Incidentally, the former process can be carried out by various media such as for example a PC client, a telephone and a facsimile equipment.

FIG. 4 is an operational flow chart of the process of setting or changing contact reception-environment information of a 65 PC client by accepting an operation from the PC client preparatorily so that the CTI system according to the present

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invention executes message routing, that is, information transmission. The process is executed on the basis of the associative operation of the PC client and the internet server 205 and CTI server 300 in the system according to the present invention. In the CTI server 300, the CPU 319 executes the contact manager program 312 to thereby carry out the process. That is, each program is executed by the CPU 319, so that various functions defined by the program operate to execute the process. Hereinafter, such programs per se will be described as a subject of achievement of various processes for convenience of description.

For this process, the contact manager program 312 contains a program and data which are prepared in advance for achieving contact reception-environment setting GUI in the PC client. The program and data are sent to the PC client by the contact manager program 312 in accordance with a request from the PC client. Further, the contact manager program 312 carries out a process for setting the condition of reception as will be described later. The contact manager program 312 contains a program and data which are prepared in advance for achieving GUI therefor.

As such contact reception-environment setting GUI, for example, the shown in FIG. 5 is prepared. The content of the user contact information table 700A shown in FIG. 7 is set by this contact reception-environment setting GUI. Incidentally, the contact format information 708 shown in FIG. 8 is set by the reception condition setting GUI shown in FIG. 6 as will be described later.

Classifying roughly, the GUI shown in FIG. 5 has four areas. This is, an area al for indicating the contact receptionenvironment setting, an area a2 for setting the validity of contact adjustment execution, an area a3 for setting location. contact-enabling/disabling in the location and recording in the contact-disabled state, and an area a4 for setting the contact-enabled condition, are displayed on a setting screen. Regions called "buttons" for performing operations and settings and character/symbol input regions for inputting characters, symbols or codes are arranged in these areas. A function of inputting an instruction concerning an operation defined by each of the button regions is fulfilled when the position of the button region is clicked, for example, by a

The GUI used in this embodiment is not limited to the example shown in FIG. 5. For example, various kinds of GUI having button regions, character/symbol input regions, etc. can be used and these regions function in the same manner as shown in FIG. 5.

An OK button 511 for instructing the confirmation of the contact reception environment which has been already set, a CANCEL button 512 for instructing the cancellation of the setting and a HELP button \$13 for accepting a request to display a guide message for the operation are arranged in the area al.

A validity instruction input portion 521 for setting whether contact adjustment according to the present invention is to be executed or not, is provided in the area a2. That is, the adjustment is validated when the validity instruction input portion 521 is marked with the symbol "X", and the adjustment is invalidated, that is, an instruction to invalidate the adjustment according to the present invention can be inputted when the validity instruction input portion 521 is blanked. In practice, the validity can be set not by the operation of marking the position with the symbol "X" but by the operation of clicking the position. As a result of the operation, the symbol "X" is displayed and the acceptation of the instruction is displayed. This rule concerning the

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operation and display is not limited to this but applies to other GUI which will be described layer.

A location/whereabouts input portion 531, a schedule association validity instruction input portion 532 for inputting whether schedule association is validated or not, senabled/disabled input portions 533 and 534 for inputting contact-enabled/disabled information, and a contact-disabled recording means input portion 540 for inputting recording means when contact is disabled or when the contact condition is not satisfied, are provided in the area a3. 10

In the location/whereabouts input portion 531, the location of a user on the receiving side can be inputted by character. Though not shown in FIG. 5, locations or whereabouts inputted in the past may be stored so that suitable one can be selected from the stored locations. Alternatively, standard locations or whereabouts may be prepared so that suitable one can be selected from the locations.

When the schedule association validity instruction input portion 532 is marked with the symbol "X", the location or whereabouts is acquired automatically with reference to the schedule information of the user so that the acquired location or whereabouts can be reflected as the location or whereabouts information. When the schedule association validity instruction input portion 532 is blanked, linking to the schedule information can be invalidated. In this case, the input of the designated location or whereabouts is validated. Incidentally, the user schedule information used is managed by the contact manager program 312.

A contact-enabled setting portion 533 and a contact-disabled setting portion 534 are provided in the enabled/disabled input portions 533 and 534. Here, either instruction is validated. Incidentally, when either portion is clicked, the display format is changed so that the acceptance of the instruction is indicated. For example, the acceptance of the instruction is indicated by the dot expression as shown in FIG. 5. Incidentally, the acceptance format of this operation and the display format of the acceptance result apply to other GUI which will be described later.

Input portions 541 to 543 for designating recording means in accordance with telephone reception, mail reception and facsimile reception respectively and input portions 545 to 547 for inputting telephone number, mail address, etc. in accordance with telephone reception, mail reception and facsimile reception respectively are provided in the contact-disabled recording means input portion 540. Designation can be made by inputting characters or symbols directly through a keyboard into any of these input portions or a pull-down menu 544 may be provided so that recording means prepared in advance or designating means inputted in the past are displayed for selection. In FIG. 5, the pull-down menu 544 is opened for inputting in the input portion 541.

Three input regions 550 concerning "place of business trip" 550a, "home" 550b and "place of work" 550c are prepared as windows in the area a4. These input regions are prepared normally in the system because these are typical locations or whereabouts. It is a matter of course that these input regions need not be prepared in advance and may be prepared whenever necessary. By clicking a headline portion in each input region, the region subjected to clicking is displayed in front and inputting is enabled. FIG. 5 shows the case where the "place of business trip" 550a is selected and inputting is enabled. Incidentally, the CTI system according to the present invention is not limited thereto. For example, windows may be prepared so that the locations or whereabouts inputted in the location/whereabouts input portion 531 in the area a3 are used as headlines of the windows.

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Further, when the schedule association is validated, windows may be prepared so that the locations or whereabouts registered in the schedule managed by the contact manager are used as headlines of the windows.

A contact means input portion 552 (5521 to 5523) for setting contact means in accordance with respective locations, a contact point input portion 553 (5531 to 5533) for setting contact points in accordance with respective locations, a condition setting start portion 551 as a region for starting a screen for setting a condition, and a set condition display portion 554 for displaying set conditions, are provided in the area a4. In the example shown in FIG. 5, the contact means input portion 552 has three input regions 5521 to 5523, the contact point input portion 553 has three input regions 5531 to 5533, and the set condition display portion 554 has three input regions 5541 to 5543. Of course, this is only an example and the number of input regions is not limited thereto.

In the contact means input portion 552, a pull-down menu 5524 can be displayed so that, when a target contact means such as telephone is designated, inputting is enabled. FIG. 5 shows a state in which a pull-down menu in the contact means input region 5521 is opened. Such a pull-down menu is provided in each of the contact means input regions 5521 to 5523. Though not shown, the contact point input portion 553 can be configured in the same manner as the contact means input portion 552. Of course, a specific contact means and a specific contact point can be inputted directly in the contact means input portion 552 and the contact point input portion 553.

Incidentally, when this CTI system is installed, for example, in a specific enterprise, contact means and contact points given to a user in the enterprise with respect to the "place of work" 550c may be registered in advance as standard values of this system.

The condition setting start portion 551 is defined as a software key. Accordingly, by clicking this region, a program and data prepared in advance for the contact manager program 312 can be sent to a PC client to achieve condition setting GUI. Specifically, GUI shown in FIG. 6 is sent to a PC client as will be described later. Then, the contact manager program 312 accepts an operation through the GUI and processes the setting of the reception condition.

The set condition display portion 554 is a region for displaying conditions set by the condition setting GUI which will be described later. When a plurality of conditions are set in accordance with the contact means 5521 to 5523, the plurality of conditions can be displayed. In the example shown in FIG. 5, two conditions are displayed in accordance with the contact means (1) and (2). Incidentally, the number of conditions allowed to be displayed is not limited thereto. When all conditions cannot be displayed, conditions not displayed may be displayed by scrolling.

The reception condition setting GUI shown in FIG. 6 is configured so that information received by a contact means selected on the basis of the GUI shown in FIG. 5 is set more finely by a receiver. Dividing roughly, the reception condition setting GUI shown in FIG. 6 has three areas. That is, an area b1 for performing instructions concerning the reception condition setting, an area b2 for performing inputting for reception conditions of the contact, and an area b3 for displaying conditions set in the area b2, are displayed on a setting screen. Regions called "buttons" for performing operations and settings and character/symbol input regions for inputting characters or symbols are arranged in these areas. A function of inputting an instruction concerning a

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procedure defined by each of the buttons is fulfilled when the position of the button region is clicked, for example, by a mouse. The operation through the GUI shown in FIG. 6 is carried out by a receiver to thereby set the content of the table shown in FIG. 8.

The area b1 is an area for performing various instructions concerning reception conditions. An ADD button 611 for performing an add instruction, a DELETE button 612 for performing an instruction to delete the existing setting of a specific reception condition, an OK button 613 for instruct- 10 ing the confirmation of the reception condition which has been already set, a CANCEL button 614 for instructing the cancellation of the setting and a HELP button 615 for accepting a request to display a guide message for the operation are arranged in the area b1.

A priority designation portion 620 for designating the aforementioned priority, a sending means input portion 630 for inputting the designation of a sending means in the sending source, an address input portion 640 for inputting telephone number, mail address, facsimile number, etc., a date input portion 650 for inputting the designation of date, a contact format designation portion 660 for designating the contact format, a contact content designation portion 670 for designating the contact content, and an option input portion 680 for inputting the designation of option items, are 25 arranged in the area b2.

In the priority input portion 620, ALL 621 for accepting all formats, EXPRESS 622 for accepting only reception designated as express mail and ORDINARY 623 for accepting reception designated as ordinary mail can be designated. These designations can be made by clicking the corresponding regions. FIG. 6 shows an example where ALL 621 is designated. Accordingly, the display format of ALL 621 is made different from the other format.

The sending means input portion 630 is provided as a region for performing inputting for designating a sending means specifically. Not only a sending means can be designated by inputting of characters or symbols directly to the input portion 630 but also a selection menu 631 can be provided in the input portion 630 by displaying means prepared in advance or inputted in the past as shown in FIG.

A region for inputting telephone number, mail address, etc. for each means in the sensing source is provided in the 45 address input portion 640. Not only characters, symbols and/or codes can be inputted directly to the input portion 640 but also the aforementioned menu (not shown) may be provided in the input portion 640 for selective inputting.

A date input portion 651 for inputting the desired date of 50 reception and a time input portion 652 for inputting the desired time of reception are provided in the date input portion 650.

An input portion for setting the timing of contact is provided in the contact format designation portion 660. The 55 input designating operation and the display of the operating result are the same as the aforementioned contact-enabled/ disabled designation input. In FIG. 6, suitable one can be selected from IMMEDIATE 661, DELAYED (arbitrary) 662 for delaying contact for an arbitrary time and DELAYED 60 (designation) 663 for delaying contact for a designated time. Further, input portions 664 and 665 are provided for designating the date and time of contact when DELAYED (designation) is designated.

Incidentally, there is some case where the designation of 65 the contact format in the contact format designation portion 660 is nonsense in terms of the characteristic of reception

means as shown in FIG. 13 which will be described later. Accordingly, in the GUI program, nonsense choices among all choices in the contact format designation portion 660 are preferably inactivated in the system side in advance with reference to information shown in FIG. 13 when a reception means is designated.

The contact content designation portion 670 is a region for accepting an input for designating the degree of the content to be transmitted. Regions of ONLY INFORM 671, ONLY ITEM TITLE/COMMENT 672, ONLY TEXT 673, ENTIRE INFORMATION 674 and BEST EFFORT 675 for performing conversion as sufficiently as possible are provided in the contact content designation portion 670. Any of those designations is selectively accepted in the correspond-

Incidentally, the content of contact in the contact content designation portion 670 is limited in terms of the characteristic of reception means, for example, as shown in FIG. 11 which will be described later, so that there is some case where the designation of the contact content is nonsense. Accordingly, in the GUI program, nonsense choices among all choices in the contact content designation portion 670 are preferably inactivated in the system side in advance with reference to information shown in FIG. 11 so that the nonsense choices cannot be selected by the receiver when a reception means is designated.

TRANSLATION VALIDITY (English to Japanese) 681 for performing designation to validate translation and LEAST COST ROUTING (LCR) 682 for performing designation to validate least cost routing are provided in the option input portion 680. By clicking a process to be designated, the designation is accepted. The accepted process is marked with "X" which shows the acceptance of the designation.

A set condition display portion 690 is arranged in the area b3. The set condition display portion 690 is a region for displaying conditions set as described above. Although FIG. 6 shows the case where two conditions are displayed, the present invention is not limited thereto. The same display content as in FIG. 5 is displayed.

A procedure for setting a contact reception environment by use of the aforementioned GUI will be described below with reference to FIG. 4.

This process is started when a user uses a WWW browser of a PC client to make access to a contact reception environment screen by logging-on. That is, when the aforementioned access from a PC client is made, the contact manager program 312 is started. The program 312 carries out a process for accepting the access as a request to start the setting or changing of contact reception-environment information to thereby make the setting operation in the PC client possible (step 401). That is, when the aforementioned access is made, the CTI server 300 is connected to the internet server 205 through the LAN 207 from the PC client or through the telephone network TCN. The internet server 205 communicates with the contact manager program 312 of the CTI server 300 on the basis of the accessed address. After user certification by password, a program and data for providing the contact reception-environment setting GUI shown in FIG. 5 are loaded into the PC client which is an

Then, the contact manager program 312 accepts the setting or changing operation from the user on the contact reception-environment setting GUI and executes a setting or changing process in accordance with an instruction designated by the operation (steps 402, 403 and 404). That is,

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button 511 is clicked, the environment setting is terminated (step 409). The reception environment data set by clicking of the OK button 511 are sent to the CTI server 300 through the internet server 205 and stored, in the form of a user contact information table shown in FIG. 7 and a user location contact condition information table shown in FIG. 8, in the user contact information database 304 by the contact manager program 312.

Setting or changing of the contact reception-environment information from telephone or facsimile will be described.

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firstly, the setting for validating or invalidating contact adjustment execution is accepted (step 402). Secondly, the setting of a contact point, the setting of validating schedule association for automatically reflecting whereabouts registered in schedule management in association with the schedule management function of the contact manager, the setting of contact-enabling/disabling, and the setting for storing a message in the case of contact-disabling or in the case of out-of-condition are accepted (step 403). Specifically, in this step, the setting of a recording means for recording information such as a message, or the like, for example, the setting of a message box, a mail box, and a facsimile information storage, and the setting of the contact point of the recording means are accepted. Thirdly, the setting of contact-enabled means in accordance with location such as place of business trip, place of work or home, and the setting of telephone number and/or mail address indicating a contact point for access to each contact-enabled means are made (step 404). Examples of the contact means include a telephone, a facsimile equipment, a mail, a portable telephone, and a pocket bell or pager. Further, a plurality of contact means can be set as information-reception-enabled means from a plurality of means. The setting of the work place is essential in the setting of information indicating a contact point, so that the mail address and telephone number 25 of the work place are automatically set as an opened main mail address and a telephone number.

Setting or changing of the contact reception-environment information from telephone or facsimile will be described below. FIG. 9 is an operational flow chart in the case where contact reception-environment information is set or changed from telephone or facsimile.

Then, the contact manager program 312 accepts the setting as to whether setting is terminated in the state already set or whether contact by the set contact means is made under a certain condition (steps 405a and 405b). That is, when the OK button 511 is clicked, the reception-environment setting screen (GUI) is terminated (step 409). On the other hand, when the condition setting button 551 is clicked, the contact manager program 312 sends a program and data to the PC client for providing the reception condition setting GUI shown in FIG. 6. Then, the operation of inputting to the reception condition setting GUI shown in FIG. 6 is accepted (step 406).

When a user makes a dial call from telephone or facsimile to a contact reception-environment setting or changing service, a starting instruction is accepted in response to the dial call (step 901). That is, in the case of a call from the telephone network TCN, the PBX/ACD control program of the PBX 202 and the CTI server 300 informs the system execution management program 317 of the detection of the call. On the other hand, in the case of a call from the internet ITN, the internet server control program 314 of the internet server 205 and the CTI server 300 informs the system execution management program 317 of the detection of the call. The system execution management program 317 informed of the detection of the call starts the contact manager program 312. The contact manager program 312 uses the IVR program 310 to induce logging into the contact reception-environment setting or changing service by password certification on the basis of voice inputting or keypad inputting of telephone or facsimile.

In the reception condition setting GUI, the setting of the priority (EXPRESS, ORDINARY, ALL) of the transmission message, sending source means, sender telephone number or mail address, and the date of reception of the transmission message is accepted as a filter condition for the message to be transferred. Further, the contact format (IMMEDIATE, 45 DELAYED, DELAYED for a designated time) in data transfer, the content of contact (only inform, only item title or comment, only text, entire information, and Best Effort), and option designation (validating translation, validating least cost routing) are set and the operation of setting a 50 necessary condition group by clicking the ADD button 611 and the DELETE button 612 is accepted (step 407).

Then, the contact manager program 312 uses the IVR program 310 to convert the reception-environment setting or changing menu preliminarily stored in the voice database 303 into voice to thereby make voice response to a receiver of telephone or facsimile (setting of entire information and changing of designated information) (step 902). That is, speech response is given to the user. The number of the menu given by keypad inputting or voice inputting is received from the user, so that the designation of selection of the menu is accepted (step 903). Further, the contact manager program 312 uses the IVR program 310 so that a guide message registered in the voice database 303 in accordance with each information item of receptionenvironment information concerning the selected menu is given as voice response to the user. A replay given from the user by keypad inputting or voice inputting in the manner of successive confirmation is accepted. Setting or changing is performed on the basis of the replay from the user (step 904).

Incidentally, in the setting of the contact format, the display of choices which cannot be selected by the contact means set previously is inactivated. Accordingly, choices in activated display are accepted. When, for example, the contact means is telephone, facsimile or portable telephone, the display of the DELAYED format is inactivated. When, for example, the contact means is mail, the display of the IMMEDIATE format is inactivated. When, for example, the contact 25 means is a pocket bell or pager, both the display of the DELAYED format and the display of the "DELAYED for a designated time" format are inactivated.

After information setting or changing is completed, a question as to whether setting or changing is to be further continued or terminated is given to the user by speech by use of the IVR program 310. A reply to this question is accepted by keypad inputting or voice inputting (steps 905, 906 and 907).

When clicking of the OK button 613 is accepted after the condition setting is terminated, the situation of the procedure 65 ence to FIG. 10. First, the CTI the procedure from the step 405a is repeated. When the OK outside, receives

Incidentally, the reception-environment information set by voice inputting in this operation is subjected to voice recognition by the IVR program 310. All the set data are stored integrally in the user contact information database 304 by the contact manager program 312 in the same manner as in the case of setting from the PC client.

Next, the operational flow of a message routing process by the CTI server 300 will be described below with refersence to FIG. 10.

First, the CTI server 300 detects transmission from the outside, receives a message given to the receiver from the

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sending source, stores the message in the work memory 305 and informs the system execution management program 317 of the detection of the transmission message (step 1001). In this process, a program corresponding to the sending means in the sending source performs a process of receiving the 5 message and delivers the process to another program. As shown in FIG. 3, in the case of a call from a telephone or a facsimile equipment, the PBX/ACD control program 309 detects the transmission via the PBX/ACD 202 and the PBX interface 301. In the case of internet, the internet server 10 control program 314 detects the transmission via the internet server 205 (see FIG. 2) and the LAN interface 302. Then, the sending means, sender telephone number, sender mail address, receiver telephone number information (ANI/ DNIS), receiver mail address, sending date and priority are collected in each of the programs. Further, the electronic mail sent from a PC is detected by the groupware control program 313 via the groupware server 203 and the LAN interface 302. The groupware control program 313 collects the sender mail address, priority, sending date and receiver 20 mail address. These programs store the collected information as transmission message information (the sender telephone number or address; sending means; priority [always handled as EXPRESS in the case of telephone or facsimile? sending date; receiver telephone number or address) in the work memory 305. Further, the PBX/ACD control program 309, the internet server control program 314 or the groupware control program 313 informs the system execution management program 317 of the detection of the transmis-

Then, the system execution management program 317 specifies the contact adjustment state of the receiver (step. 1002). This specification is achieved as follows. The system execution management program 317 retrieves opened main telephone number 702 or opened main mail address 703 from the user contact information table 700 (see FIG. 7) on the user contact information database 304 on the basis of the receiver telephone number or receiver mail address stored in the work memory 305 and specifies a coincident contact adjustment state 704. Here, a judgment is made as to 40 whether the contact adjustment state is valid or not (step 1003). If the contact adjustment state is valid, the system execution management program 317 starts the telephony agent program 311. On the contrary, if the contact adjustment state is invalid, the system execution management 45 program 317 stops the processing of the message to the destination, deletes information concerning the destination from the work memory 305, and informs the PBX/ACD control program 309, the internet server control program 314 or the groupware control program 313 of the execution 50 of normal routing in the same manner as the sending means (step 1004).

Then, the telephony agent program 311 specifies the contact-enabled/disabled state, contact means, contact point and contact condition of the receiver (step 1005). This 55 specifying operation is achieved as follows. The telephony agent program 311 searches the user contact information table 700A in the same manner as in the specifying operation of the contact adjustment state. Description will be made about the case where, for example, a sender S sends an 60 EXPRESS text mail to receivers A, B and C from a PC as shown in FIG. 1. In this case, the user contact information table 700A is searched by using the mail addresses A-aaa, B-bbb and C-ccc of the receivers A, B and C, so that information is specified as follows.

Receiver A: contact enabled/disabled=enabled, contact means-portable telephone, contact point-AA22, contact condition=(priority=ALL, sending means=ALL, sending source telephone number/address=ALL, date=ALL, contact format=IMMEDIATE, contact content=Best Effort, option= None); (shown as "XXXXXXX" in FIG. 7);

Receiver B: contact enabled/disabled=enabled, contact means=facsimile, contact point=BB22, contact condition= (priority=EXPRESS, sending means=ALL, sending source telephone number/address=ALL, date=ALL, contact format=DELAYED, contact content=Best Effort, option= None); (shown as "ZZZZZZZ" in FIG. 7); and

Receiver C: contact enabled/disabled=enabled, contact means-mail, contact point=C-ccc, contact condition= (priority=ALL, sending means-ALL, sending source telephone number/address=ALL, date=ALL, contact format= DELAYED, contact content=Entire Information, option= None); (shown as "VVVVVV" in FIG. 7).

Then, the telephony agent program 311 checks whether the transmission message information on the work memory 305 satisfies the contact condition such as priority, sending means, sending source telephone number or address, date, and contact content or not (step 1006). The term "check of the contact content" used herein means a check as to whether the contact content is in a range of limitation in accordance with the difference in media between the message sending means and the message receiving means as shown in FIG.

The content of checking shown in FIG. 11 is defined in the telephony agent program 311 or prepared as reference data and stored in the program memory 318. The example shown in FIG. 11 is an example in which telephone or portable telephone, mail (text mail, voice mail or facsimile mail) and facsimile are assumed as sending means whereas telephone or portable telephone, mail, facsimile and pocket bell or pager are assumed as receiving means respectively correspondingly to the above-mentioned sending means. In FIG. 11, levels concerning the limitation are expressed as A, B, C, D and E for convenience of expression. Here, level A can be used only to "inform", level B can be used up to "Item Title or Comment", level C can be used up to "Text", level D can be used up to "Best Effort", and level E can be used up to "Entire Information".

Then, the telephony agent program 311 judges whether contact is enabled or not and whether the contact condition is satisfied or not (step 1007). If it is proved that the contact is enabled and the contact condition is satisfied, the situation of the procedure goes to step 1009. On the other hand, if it is proved that the contact is disabled or the contact condition is not satisfied, the contact-disabled recording means/ contact-point information 707 on the user contact information table 700A is specified and the situation of the procedure goes to the next step (step 1008). In the aforementioned example, contact with each of receivers A, B and C is enabled and the contact condition is satisfied because the transmission message information is sender telephone number/address=S-sss, sending means=mail, priority= Express, the date of sending=xxxxx. Accordingly, the situation of the procedure goes to step 1009.

Then, the telephony agent program 311 judges the necessity of media conversion due to the difference between sending means and receiving means and the classification of conversion on the basis of the correspondence in the classification of conversion shown in FIG. 12 both in the case where the contact condition is satisfied and in the case where contact is disabled (step 1009).

The correspondence in the classification of conversion shown in FIG. 12 is defined in the telephony agent program

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311 or prepared as reference data and stored in the program memory 318. The correspondence shown in FIG. 12 is an example in which telephone or portable telephone, mail (text mail, voice mail or facsimile mail) and facsimile are assumed as sending means whereas telephone or portable telephone, mail, facsimile and pocket bell are assumed as receiving means respectively corresponding to the above sending means. In the respective correspondence, conversion into a necessary expression format is designated.

When it is proved that the conversion of the transmission message is required, the telephony agent program 311 executes necessary conversion with reference to the correspondence shown in FIG. 12 (step 1010). Incidentally, the conversion is performed by use of exclusive-use processing boards 306, 307 and 308.

When, for example, it is proved in the step 1009 that the conversion of the expression format for the receiving means is required, the transmission message is loaded to the CTI server 300 from the groupware server 203 in the case where the transmission message is a mail, or from the PBX/ACD 202 or the internet server 205 in the case where the transmission message is a telephone or facsimile call. The IVR program 310 sends the transmission message to corresponding one of the boards such as a character recognition board 306, a TTS (text to speech) processing board 307 and an 25 ASR (speech to text) processing board 308. Further, if the contact condition is satisfied, media conversion is executed in accordance with the designation of the contact content. If contact is disabled, media conversion is executed in accordance with the designation of "Best Effort". Results of the 30 conversion are stored in the work memory 305 (step 1010). If conversion is not required, the situation of the procedure goes to the next step. For example, in the aforementioned case where the transmission message is a text mail, text-tospeech conversion is executed in accordance with "Best 35 Effort" for the receiver A having the receiving means of potable telephone, text-to-image conversion is executed in accordance with "Best Effort" for the receiver B having the receiving means of facsimile, and conversion is not required for the receiver C having mail as the receiving means 40 because the sending means and the receiving means are coincident with each other.

Finally, the telephony agent program 311 routes the message destined for receivers satisfying the contact condition by the classification of processing corresponding to the 45 receiving means and the contact format designation of the contact condition shown in FIG. 13 and executes processing designated on the user contact condition information table 800 shown in FIG. 8 if necessary (step 1011). That is, a process for adding designated processing to the transmission 50 message on the work memory 305, on the groupware server 203, on the PBX/ACD 202 or on the internet server 205 is executed if the message range and option are designated in the contact content designation. Then, the message is routed to the receivers by execution of the automatic call distribution control of the PBX/ACD 202 based on the PBX/ACD program 309, the call routing control based on the internet server control program 314 or the mail routing control of the groupware server 203 based on the groupware control program 313. Examples of the option designation include 60 selection of English-to-Japanese translation and selection of least cost routing (LCR) processing of the PBX function or LCR processing for selecting an internet-using process when transfer can be made through internet telephone/facsimile.

In the aforementioned case, as shown in FIG. 1, a call is 65 sent to the receiving means which is a portable telephone of the receiver A by immediate transfer processing, so that the

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transmission message after text-to-speech conversion is read aloud to the receiver A. A call is sent to the receiving means which is a facsimile equipment of the receiver B by immediate transfer processing, so that the transmission message after text-to-image conversion is outputted. Further, the transmission message is directly transferred to the mail address of the receiving means which is mail means of the receiver C by delayed transfer processing.

Further, the transmission message for a contact-disabled receiver is routed to the destination of the contact-disabled recording means, that is, the transmission message on the work memory 305, on the groupware server 203, on the internet server 205 or on the PBX/ACD 202 is routed by execution of a corresponding program, that is, execution of the automatic call distribution control of the PBX/ACD 202 in accordance with the PBX/ACD program 309, the call routing control in accordance with the internet server control program 314 or the mail routing control of the groupware server 203 in accordance with the groupware control program 313 (step 1011). Incidentally, recording to the message box is achieved by storing the transmission message in the voice/facsimile database 303 in accordance with the IVR program 310, and recording to the facsimile information storage is achieved by storing the transmission message in the voice/facsimile database 303 in accordance with the facsimile control program 315. With respect to these messages, a receiver can make access to the CTI server 300 from telephone, facsimile or PC later so that the receiver can verify the transmission message recorded at the contactdisabled time from the voice/facsimile database 303 in accordance with the IVR program 310.

By the aforementioned configuration and operation, message routing in accordance with the receiving means and contact condition allowed to be used at the contact point can be provided to the user without depending on the message sending means. Accordingly, a multimodal communication environment can be constructed in an office environment in which various offices such as a home office, a mobile office, etc. are connected by a communication network. As a result, the user can make communication by means allowed to be used by himself/herself at the point of time regardless of the location of the user in the office environment. Furthermore, both the relaxation of limitation in the communication means and the degree of freedom in selection of means are given to the user, so that both speediness and efficiency in office work are attained. Further, the existing telephone network environment can be utilized effectively, so that there is no necessity of introducing an integrated system into all the office environment and there is no necessity of providing any means added to the communication means for the user individually. Accordingly, a low-cost total information transfer/information sharing environment can be constructed and developed easily.

Another embodiment of the present invention will be described below with reference to FIGS. 2, 3, 14 and 15. The embodiment in FIGS. 14 and 15 shows, as an example, a system which can be applied not only to human-to-human message routing for human users but also to work system communication such as human-to-work system communication, or work system-to-work system communication.

The system configuration and operation are basically the same as in the embodiment shown in FIGS. 4 through 13, except the operation of setting or changing contact reception-environment information, that is, except that a manager of the work system sets or changes environment information and except that access from the browser of the

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PC client for the setting or changing process is made to a system reception-environment setting screen shown in FIG. 14. That is, in the case of a work system, the location or whereabouts is not changed dynamically in comparison with the reception-environment setting screen in the case where the user is a human being. Accordingly, both the designation of automatic whereabouts-changing in association with the schedule management function of the contact manager program 312 and the setting of contact-enabled means or contact condition in accordance with the location or whereabouts are not required. Further, this applies also to the setting or changing process of the reception environment from telephone or facsimile.

Incidentally, the basic configuration of the system reception-environment setting GUI in FIG. 14 is the same as ¹⁵ the GUI shown in FIG. 5 except the aforementioned points of difference, so that the same parts of FIG. 14 as those in FIG. 5 are correspondingly referenced for omission of duplicated description.

In the seiting process through the system reception-environment setting GUI shown in FiG. 14, the setting and changing is performed by the system manager as described above, so that the necessity in response to another user's request from the outside in the same manner as in the contact reception-environment setting GUI shown in FiG. 5 is eliminated. Accordingly, the contact manager program 312 of the CII server 300 sends a program and data for providing the GUI of FIG. 14 to the PC client 209 in response to access from the PC client 209 of the system manager in the LAN 207. As a result, setting can be made in the same manner as in the GUI of FIG. 5. Alternatively, the program and data for providing the GUI of FIG. 14 may be stored in the PC client 209 of the system manager in advance.

The reception environment data thus set are stored, in the form of a system contact information table 700B shown in FIG. 15, in the user contact information database 304. The inputting of information, for example, to an ordering/stock management system or purchase system on the business application server 204 or to an examination/approval work-flow system on the groupware server 203 is executed by the groupware control program 313 or the business application control program 316 in the CTI server 300 on the basis of the set information on the table 700B.

The configuration of the system contact information table 45 700B is basically the same as that of the user contact information table 700A in FIG. 7. Accordingly, the same parts are correspondingly referenced for omission of duplicated description. Incidentally, the difference between the tables 700A and 700B is only a difference in information set therein. For example, user name 7012 is shown on the table 700A whereas system name 7012 is shown on the table 700B. This is because of a difference between subjects of information reception, but the two tables 700A and 700B are quite the same in terms of the information for specifying the subjects of information reception. Accordingly, the two tables A and B may be combined into a single table.

By the aforementioned configuration and operation, reception-environment information in each work system can be also registered in the user contact information database in the same manner as in the case where the user is a-human being. Accordingly, message routing in accordance with receiving means can be achieved also in the case where subjects of communication are not only human beings but also information systems.

A further embodiment of the present invention will be described below with reference to FIGS. 2, 3, 7 and 10 and 24

FIGS. 16 through 19. This embodiment shows the case where message routing is performed while the sending side selects and sets the contact transmission condition from the contact reception condition of the receiving side so that the contact request condition on the message sending side is also reflected.

The system configuration and operation in this embodiment are basically the same as those in the embodiments shown in FIGS. 4 through 13, except the following point of difference in the operation. That is, a process for setting or changing the contact transmission environment is added to the process for setting or changing the reception environment. For the process for setting or changing the contact transmission environment, the contact manager program 312 prepares a program and data for achieving the contact transmission-environment setting GUI in the PC client. The contact manager program 312 sends the program and data to the PC client in accordance with a request from the PC client.

FIG. 17 shows an example of the contact transmission-environment setting screen through the contact transmission-environment setting GUI. This GUI roughly has four areas. That is, an area c1 for making an instruction concerning the setting of the contact transmission environment, an area c2 for setting the validity of execution of contact adjustment, an area c3 for setting the transmission request condition and an area c4 for displaying set conditions are displayed on a setting screen. Regions called "buttons" for carrying out operations and settings and character/symbol input regions for inputting characters or symbols are arranged in these areas. When the position of each of the button regions is clicked by a mouse, or the like, a function of inputting an instruction concerning an operation defined in the button is exhibited.

The area c1 is an area for carrying out various instructions concerning the transmission condition. An ADD button 811 for making an adding instruction, a DELETE button 812 for making an instruction to delete the existing setting of a specific reception condition, an OK button 813 for making an instruction to confirm the set reception condition, a CANCEL button 814 for making an instruction to cancel the setting and a HELP button 815 for accepting a request to display a guide message concerning the operation are arranged in the area c1.

Contact transmission adjustment execution input regions are provided in the area c2 for performing setting on the transmission-environment setting screen as to whether execution of contact adjustment is valid or not. When each of the input regions is clicked, the input region is marked with the symbol "X" showing an instruction to validate the execution.

A transmission request condition input portion 830 for inputting the designation of the transmission request condition for the sending means in the sending source, a priority designation portion 840 and a contact content designation portion 850 are arranged in the area c3. Regions for inputing sending means 831 classified by contact point, designation name 832, desired receiving means 833 and telephone number or mail address 835 for the means are arranged in the transmission request condition input portion 830. Designation items can be inputted in these regions by a character or a symbol through a keyboard, or the like. Further, designation can be inputted through a menu 834 for displaying designation items prepared as references in advance or items designated in the past and selectively designating one of the items.

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Regions for accepting the designation of either EXPRESS 841 or ORDINARY 842 are provided in the priority designation portion 840. When either region is selected, the display format of the selected region is changed. In FIG. 17, the selected region is painted out with one color.

Regions for accepting inputs for designating the degree of the content to be transmitted are provided in the contact content designation portion 850. That is, regions of "only inform" 851, "only item title or comment" 852, "only text" 853, "entire information" 854 and "Best Effort" 855 are 10 provided in this portion 850. The designation of selection of any one of these regions is accepted.

A set condition display portion 860 for displaying set conditions designated by the aforementioned regions is provided in the area c4.

The designations or settings thus inputted in FIG. 17 are stored in the user contact transmission condition information table 800 shown in FIG. 18. User number 8011 as an identifier for indicating a user, contact adjustment state information 802 for indicating whether adjustment for transmission of information on the receiving side is valid or not, sending means information 803 which is information indicating sending means, destination name information 804 for indicating an destination and contact request condition information 805 for indicating contact request conditions are stored in the table shown in FIG. 18.

Desired receiving means information 8051 for specifying a desired means for receiving information to be transmitted. receiving-side telephone-number/address information 8052 for indicating telephone number or mail address of a receiving side, priority information 8053 for indicting priority, and contact-content information 8054 for indicating the designation of the contact content, are set in the contact request condition information 805. The setting items in these regions $_{35}$ are the same as in the case of the table shown in FIG. 7, so that duplicated description will be omitted.

A process for setting or changing the contact transmission-environment information in this embodiment will be described below with reference to FIG. 16. FIG. 16 40 is an operational flow chart of the process for setting or changing the contact transmission-environment information from the PC client.

First, this process is started when a user makes access to the contact transmission-environment setting screen from a 45 WWW browser of a PC client by logging-on. That is, if the aforementioned access is made from a PC client, the contact manager program 312 is started. The program 312 carries out a process for accepting the access as a request to start the process for setting or changing the contact transmissionenvironment information so as to make the setting operation in the PC client possible (step 1601). That is, if the aforementioned access is made, the CTI server 300 is connected to the internet server 205 through the LAN 207 or telephone network TCN from the PC client. The internet server 205 55 communicates with the contact manager program 312 of the CTI server 300 on the basis of the accessed address. After user certification based on password, a program and data for providing the contact transmission-environment setting GUI shown in FIG. 17 are loaded into the PC client of the access so tioned added process because the transmission contact

Then, the user's setting is accepted on the PC client through the transmission-environment setting screen of the transmission-environment setting GUI as to whether execution of contact adjustment is valid or not (step 1602). 65 Further, the setting of contact transmission request conditions, such as sending means classified by contact

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point, destination name, desired receiving means, telephone number or mail address to the means, priority, and contact content is accepted on the same screen (step 1603). Here, among the setting items for the contact transmission request conditions, only items satisfying the contact reception condition on the receiving side are displayed so as to be activated as selection items. That is, if a sending means and a transmission destination name on the sending side are inputted, information, such as contact adjustment state, contact-enabled/disabled, contact-enabled means, contact point and contact condition, corresponding to the destination name on the user contact information table 700A in the user contact information database 304 is retrieved by the contact manager program 312 in the CTI server 300. When the retrieval result shows the case where the contact adjustment state is invalid or contact is disabled, all setting items except the sending means and the transmission destination name on the sending side are displayed so as to be inactivated. Otherwise, items satisfying the retrieved information such as contact-enabled means, contact point and contact condition are selectively displayed so as to be activated.

If the clicking of the OK button 813 is then accepted, the environment setting of the contact transmission environment is regarded as being completed and the environment setting is terminated (step 1604). The transmission environment data which have been set are stored in the user contact transmission condition information table 800 of the format shown in FIG. 18 in the user contact information database 304 in the same manner as in the case of storage of the reception environment data in the embodiment shown in FIGS. 4 through 13. Further, the operation of setting or changing the transmission environment from telephone or facsimile is the same as in the case of the receptionenvironment setting in the embodiment shown in FIGS. 4 through 13, except the classification of items to be set and the number of items belonging to the contact transmissionenvironment information.

The operation of performing message routing process will be described below with reference to FIG. 19. As shown in FIG. 19, the point of difference from FIG. 10 which shows the case of only reception conditions is that a process concerning the adjustment of transmission conditions and reception conditions is added. The added process comprises: a process of specifying the sending-side state in specifying the contact adjustment state (step 1901); a process of judging whether the transmission contact adjustment is valid or not (step 1902); a process of specifying transmission/ reception contact conditions (step 1903); a process of checking matching between the transmission conditions and the reception conditions (step 1904); a process of judging the above matching on the basis of the result of the checking process (step 1905); and a process of ORing the transmission contact condition items and the reception contact condition items (step 1906). Incidentally, the steps 1001 to 1011 are equivalent to the corresponding procedures in the flow chart of FIG. 10. Accordingly, the description of the procedures in the above steps will be omitted.

When contact condition adjustment between the sending side and the receiving side is not made by the aforemenadjustment state is invalid (step 1092), the situation of the procedure goes to step 1005. Further, when contact condition adjustment between the sending side and the receiving side cannot be made in the case where the transmission conditions mismatch with the reception conditions at the time of message transmission (step 1905) because the reception conditions are changed on the receiving side after the

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sender sets the transmission conditions, the situation of the procedure goes to step 1006 and message routing is executed only in accordance with the reception contact conditions in the embodiment shown in FIGS. 4 through 13. When the transmission contact adjustment state is valid and the transmission and reception conditions match with each other, message routing is executed in accordance with conditions obtained by ORing items designated in the transmission conditions and items not designated in the transmission conditions but designated in the reception conditions.

By the aforementioned configuration and operation, the sending side can designate contact conditions from the contact conditions set by the receiving side. Accordingly, message routing having high reliability in contact can be provided so that a request on the sending side is also ¹⁵ reflected while conditions on the receiving side are made as a range of limitation.

A further embodiment of the present invention will be described below with reference to FIGS. 19 and 20. This embodiment shows an example of the case where message routing is executed so that contact reception conditions on the receiving side are automatically adjusted while contact request conditions in the message sending side are reflected in the contact conditions set by the receiving side.

The system configuration and operation are the same as those in the embodiment shown in FIGS. 16 through 19, except the process of sender's setting or changing the contact transmission environment, that is, except that a request can be set freely in a standpoint on the sending side regardless of the range of limitation in the contact reception conditions set by the receiving side, and further except the operation for message routing, that is, further except that checking the matching between the transmission and reception conditions (step 1904), judging the matching (step 1905) and ORing contact condition items on the sending and receiving sides (step 1906) are replaced by judging contact-enabled/disabled, desired reception means and priority (step 2001) and adjusting contact conditions between the sending and receiving sides (step 2002) as shown in FIG. 20.

In the step 2001, a judgment is made as to whether contact is enabled or not. If contact is enabled, a judgment is further made as to whether the desired reception means exists or not. When there is some desired reception means, priority is further judged. That is, when all of the three judgments are cleared, the situation of the procedure goes to the step 2062. When any one of the three judgments cannot be cleared, the situation of the procedure goes to the step 1006.

In adjustment of contact conditions between the sending and receiving sides in the step 2002, when the priority of the transmission condition is higher than the priority of the reception condition, for example, in the case where the sender expects "EXPRESS" as priority but the receiving side selects "ORDINARY" as priority in the receiving condition, the priority ("EXPRESS" in the aforementioned example) and contact content in the transmission conditions are employed so that reception conditions except contact format and option designation are invalidated. When the priority of the transmission condition is not higher than the priority of the reception condition, the transmission conditions are invalidated so that processing is executed only in accordance with the reception conditions in the same manner as in the embodiment shown in FIG. 19.

By the aforementioned configuration and operation, when the emergency of a transmission message is high, 65 transmission/reception contact condition adjustment using contact conditions on the sending side can be performed. 28

Accordingly, message routing automatically adjusted in accordance with priority can be provided so that request conditions on the sending side are reflected or conditions on the receiving side are reflected in accordance with the priority.

What is claimed is:

 A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

- a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and
- said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,
- wherein said reception-environment-information registration means includes storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of said system,
- wherein said means for accepting a receptionenvironment-information setting operation has a function for displaying a reception-environmentinformation setting sercen to carry out said receptionenvironment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by said accepted input; and
- said function for displaying a reception-environmentinformation setting screen displays a screen on which at least reception-condition information can be inputted, and
- wherein said function for displaying a receptionenvironment-information setting screen displays a screen on which at least one kind of information among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike-connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, language informa-

tion for indicating whether said information to be transmitted is required to be translated or not, contactcontent information for indicating the degree of the contact content of said information to be transmitted, and transfer-route information for designating a trans- 5 fer route can be inputted.

2. A computer-telephony integration system according to claim 1, wherein:

said system further comprises communication means for performing data communication with an information processing apparatus in the outside of said system; and said means for accepting a reception-environmentinformation setting operation has a function for transmitting programs and data to a requester through said communication means to carry out said function for displaying a reception-environment-information set-

ting screen and said function for accepting an input in accordance with said screen when a receptionenvironment-information setting request is accepted from the outside of said system, and further has a function for receiving said reception-environment setting data from said requester through said communication means and delivering said data to said function for making said storage means store information.

3. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether 45 or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information 50 to said contact point; and

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, 55 conversion from text to speech and conversion from image to speech,

wherein said system further comprises transmissionenvironment-information registration means for setting an environment condition in the information sending 60 side in accordance with an original destination in each of receiving-side subjects; and

said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for 65 with said reception-environment condition. accepting a transmission-environment-information setting operation from the outside of said system.

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4. A computer-telephony integration system according to claim 3, wherein said means for accepting a transmissionenvironment-information setting operation has a function for setting a contact condition of the information sending side selectively from the range of reception-environment information registered by said reception-environmentinformation registration means.

5. A computer-telephony integration system according to claim 3, wherein:

said means for accepting a transmission-environmentinformation setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmissionenvironment setting data set by the accepted input;

said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information for indicating a condition requested by the sending side can be inputted.

6. A computer-telephony integration system according to claim 4, wherein:

said means for accepting a transmission-environmentinformation setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmissionenvironment setting data set by the accepted input;

said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information for indicating a condition requested by the sending side can be innutted.

7. A computer-telephony integration system according to claim 3, wherein, when a transmission-environmentcondition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmissionenvironment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

8. A computer-telephony integration system according to claim 4, wherein, when a transmission-environmentcondition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmissionenvironment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord

9. A computer-telephony integration system for transmitting information from an arbitrary information sending

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source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

- a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and
- said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,
- wherein said system further comprises a transmissionenvironment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;
- said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment- information setting operation from the outside of said system;
- said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;
- said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;
- said means for accepting a transmission-environmentinformation setting operation has a function for dis-

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- playing a transmission-environment-information setting screen to carry out said transmission-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmissionenvironment setting data set by the accepted input;
- said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and
- said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.
- 10. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:
 - a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and
- said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,
- wherein said system further comprises a transmissionenvironment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;
- said transmission-environment-information registration means includes a storage means for storing

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transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;

- said means for accepting a reception-environmentinformation setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store receptionenvironment setting data set by the accepted input;
- said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;
- said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;
- said function for displaying a transmission-environmentinformation setting screen displays a screen on which at
 least transmission-request-condition information, priority information for indicating priority in processing
 of information to be transmitted and contact content
 information for indicating the degree of the contact
 content of said information to be transmitted can be
 inputted as a condition requested by the sending side;
 and
- said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.
- wherein both an appliance used by a human being and a work processing system for performing work processing are said receiving-side subjects.
- 11. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:
 - a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information 65 for indicating means allowed to receive information, contact-point information for designating a contact

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point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; said transmissionenvironment-information registration means including a storage means for storing transmission-environmentinformation, and means for accepting a transmissionenvironment-information setting operation from the outside of said system,

wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

inputted as a condition requested by the sending side; and

12. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

- a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception

condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination 5 in each of receiving-side subjects; said transmissionenvironment-information registration means including a storage means for storing transmission-environmentinformation, and means for accepting a transmissionenvironment-information setting operation from the 10 outside of said system,

wherein said means for accepting a transmissionenvironment-information setting operation has a function for setting a contact condition of the information sending side selectively from the range of receptionenvironment information registered by said receptionenvironment-information registration means, and

wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does 30 not accord with said reception-environment condition.

13. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact 40 point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point 50 information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting 55 nation of information transmission, said system comprising: said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point;

a transmission-environment-information registration means for setting an environment condition in the 60 information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means including a storage means for storing transmission-environment information, and means for 65 accepting a transmission-environment- information setting operation from the outside of said system;

said means for accepting a reception-environmentinformation setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store receptionenvironment setting data set by the accepted input;

said function for displaying a reception-environment information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environmentinformation setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmissionenvironment setting data set by the accepted input;

said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side;

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.

14. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a desti-

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment infor-

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mation when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,

- said system further comprises a transmissionenvironment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each 15 of said receiving-side subjects;
- said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;
- said means for accepting a reception-environmentinformation setting operation has a function for displaying a reception-environment-information setting screen to carry our said reception-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store receptionenvironment setting data set by the accepted input;
- said function for displaying a reception-environmentinformation setting screen displays a screen on which,
 among priority information for indicating priority in
 processing of information to be transmitted,
 connection-format information for indicating a timelike
 connection format of information transmission containing an instruction as to whether said information to be
 transmitted must be transmitted immediately or not,
 option information concerning said information to be
 transmitted, contact-content information for indicating
 the degree of the contact content of said information to
 be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;
- said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;
- said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and
- said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment 65 condition when a requested reception subject set in said transmission-environment-condition information can

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be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority,

wherein both an appliance used by a human being and a work processing system for performing work processing are said receiving-side subjects.

15. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

- a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point.
- wherein said reception-environment-information registration means includes storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of said system,
- wherein said means for accepting a receptionenvironment-information setting operation has a function for displaying a reception-environmentinformation setting screen to carry out said receptionenvironment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by said accepted input.
- said function for displaying a reception-environmentinformation setting screen displays a screen on which at least reception-condition information can be inputted,
- wherein said function for displaying a receptionenvironment-information setting screen displays a screen on which at least one kind of information among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a time-like-connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, language information for indicating whether said information to be transmitted is required to be translated or not, contact-content information for indicating the degree of the contact content of said information to be

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transmitted, and transfer-route information for designating a transfer route can be inputted,

wherein said system further comprises a schedule management means for managing a schedule for each reception subject; and

said means for accepting a reception-environmentinformation setting operation further has a function for setting reception-environment information with respect to said reception subject in cooperation with said schedule management means.

16. A computer-telephony integration system for transmilting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and 20 reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information 40 sending side in accordance with an original destination in each of receiving-side subjects; said transmissionenvironment-information registration means including a storage means for storing transmission-environmentinformation, and means for accepting a transmissionenvironment-information setting operation from the outside of said system,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by select- 50 ing one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein when a transmission-environment-condition information is set, said contact adjustment means 55 judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said 60 reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition 65 when said transmission-environment condition does not accord with said reception-environment condition.

17. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; said transmissionenvironment-information registration means including a storage means for storing transmission-environment information, and means for accepting a transmissionenvironment-information setting operation from the outside of said system,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said means for accepting a transmissionenvironment-information setting operation has a function for setting a contact condition of the information sending side selectively from the range of receptionenvironment information registered by said receptionenvironment-information registration means, and

wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

18. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

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- a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point 15 information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point;
- said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,
- a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;
- said transmission-environment-information registration means including a storage means for storing transmission-environment information, and means for accepting a transmission-environment- information setting operation from the outside of said system;
- said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;
- said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, so option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;
- said means for accepting a transmission-environmentinformation setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environmentinformation setting operation, a function for accepting

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- an input in accordance with said screen, and a function for making said storage means store transmissionenvironment setting data set by the accepted input;
- said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and
- said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.
- 19. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:
- a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;
- contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,
- said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,
- said system further comprises a transmissionenvironment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;
- said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;

said means for accepting a reception-environmentinformation setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store receptionenvironment setting data set by the accepted input;

said function for displaying a reception-environmentinformation setting screen displays a screen on which, 10 among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be 15 transmitted must be transmitted immediately or not. option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for des- 20 ignating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environmentinformation setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environmentinformation setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmissionenvironment setting data set by the accepted input;

said function for displaying a transmission-environmentinformation setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; 40

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said 45 transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content 50 when the transmission-environment condition has higher priority.

wherein both an appliance used by a human being and a work processing system for performing work processing are said receiving-side subjects.

20. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means 60 for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and 65 reception-condition information for indicating a con-

dition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said reception-environment-information registration means includes storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of said system,

wherein said means for accepting a receptionenvironment-information setting operation has a function for displaying a reception-environmentinformation setting screen to carry out said receptionenvironment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by said accepted input,

said function for displaying a reception-environmentinformation setting screen displays a screen on which at least reception-condition information can be inputted,

wherein said function for displaying a receptionenvironment-information setting screen displays a screen on which at least one kind of information among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a time-like-connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, language information for indicating whether said information to be transmitted is required to be translated or not, contact-content information for indicating the degree of the contact content of said information to be transmitted, and transfer-route information for designating a transfer route can be inputted,

wherein said system further comprises a schedule management means for managing a schedule for each reception subject; and

said means for accepting a reception-environmentinformation setting operation further has a function for setting reception-environment information with respect to said reception subject in cooperation with said schedule management means.

EXHIBIT 5

REDACTED

EXHIBIT 6

In The Matter Of:

CERTAIN UNIFIED COMMUNICATION

JOHN JIANG July 31, 2007

FINK & CARNEY REPORTING AND VIDEO SERVICES
39 WEST 37TH STREET

NEW YORK, NY USA 10018
(212) 869-1500 or (800) 692-3465

Original File JJ0731.TXT, 160 Pages Min-U-Script® File ID: 3922873907

Word Index included with this Min-U-Script®

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[1] conclusion.

121 THE WITNESS: Can you repeat the question?

(3) MR. NAPLES: Q. Sure. You said you understood

(4) what this meant.

A: Yes.

[6] Q: I just want to know what you understand it to

mean when the examiner says, "Although Pepe fails to

in disclose arranging the options on a single screen, this

191 would have been an obvious alternative to a hierarchical

(10) base screens to a person of ordinary skill in the art of

[11] display based interfaces."

[12] MR. POND: Same objection.

[13] THE WITNESS: What's your question?

[14] MR. NAPLES: Q. What do you understand that to

[15] mean?

[16] A: It means the examiner thinks with ordinary

[17] skills in the art of display based interfaces, that

[18] person can collapse a hierarchical set of interfaces into

[19] a single level interface.

[20] Q: Do you agree with that?

[21] A: No. Not in this particular case.

[22] Q: Okay. Why do you disagree with that?

[23] A: It requires quite a lot of thinking in order to

[24] make hierarchical way of selection to make it a

25) two-dimensional selection.

Page 58

(1) Q: What do you mean by that?

A: It's like T.V. selection. You can select

(3) channel, and then you have another way which is

(4) two-dimensional screen and you can select across channel

(5) using one interface. So that is a significant

(6) improvement over multiple clicks and down to different

n hierarchical levels.

That is why that two-dimensional selection based

p on two choices, and it's an invention by a manual

no selection, T.V. manual selection. Even in the early days

(11) you could select menu for one, two, three, four,

[12] different channels, and then go to that particular time

[13] of that channel hierarchical.

But a new invention really to be able to use —

[15] a two-dimensional menutry to use over one screen to make [16] a selection and that's considered to be invention. In

[17] the T.V. that's true.

ej **Q:** In the T.V.?

[19] A: In the T.V. industry.

[20] Q: I understand. So in your invention for — in

[21] this patent, the idea of having all of the communication

[22] services and all the communication options on one screen

[23] is inventive; is that correct?

MR. POND: Objection, calls for legal

ps conclusion.

(1) THE WITNESS: Yes.

MR. NAPLES: Q. And it's an improvement over

(3) the prior way of doing things where you may have a drop

(4) down menu or various drop down menus in order to change

is the options; is that correct?

[6] MR. POND: Objection, calls for legal

何 conclusion.

(a) THE WITNESS: It is an improvement over separate

191 screens rather than drop down menu. Separate

no hierarchical screens.

[11] MR. NAPLES: Q. So a drop down menu, though,

[12] would be separate screens; is that correct?

[13] A: Yeah. You drop down, it's a separate screen.

[14] Normally drop down can be viewed as a single screen

[15] rather than separate pages. Yes.

In the same analogy, I mentioned T.V., right,

(17) the two-dimensional menu selection of the T.V. channel at

[18] a particular time is a significant improvement and it's

(19) an invention over hierarchical way of selecting.

[20] Q: When you say hierarchical way, in connection

[21] with the 064 patent, what do you mean?

22] A: Hierarchical meaning it's like the top level,

[23] followed by another level, followed by another level,

(24) multiple screens.

[25] Well, essentially here we're using a

Page 60

(1) two-dimensional single level view to set option.

2 Q: So, for instance, with respect to the

(3) communication services and the communication options

(4) disclosed in the 064 patent, what would be an example of

15] a hierarchical screen set up for those services and

(6) options?

MR. POND: Objection, calls for a legal

(8) conclusion.

m THE WITNESS: An example could be started with

[10] the least of communication services from which you'll

nn select one, and then you go to another page, and then you

1121 have a list of options. And you select one of the

[13] options. You go to another page and you select — use

[14] that option.

MR. NAPLES: Q. Your lawyers also responded to

(15) this rejection and amended the claims again, so let's

[17] turn to that and see what your lawyers did.

[18] If you turn to the office action — the response

1191 starts at ABS 357. And at ABS 358 you'll see what was

[20] added to name one in response to the office — I'm sorry,

121) in response to the office action it said, "Using one menu

1221 was obvious." In the underlined language again and what

was that, if you could just read that for me? I would

[24] have a few questions for you.

25] A: Got it.

~·>iG

JOH	N JI	ANG
July	31,	2007

CERTAIN UNIFIED COMMUNICATION

	Page 157			Page 159
[1]	proceeding in the deposition of Dr. Jiang. We are now	10	I, JOHN JIANG, Ph.D, have read the foregoing	
	going off the record, and the time is 3:42 p.m.		deposition and hereby affix my signature that same is	
[3]	(Whereupon, the deposition was adjourned at	[3]	true and correct, except as noted above.	
	3:42 p.m.)	[4]		
[5]		[5]	JOHN JIANG, Ph.D.,	
[6]		[6]		
[7]		10		
		(6)	Before me, on this day personally	
[8]		1	appeared JOHN JIANG, Ph.D, known to me (or proved to me	
[9]		1.	under oath or through) (description	
[10]		1 .	of Identity card or other document) to be the person	
[[1]			whose name is subscribed to the foregoing instrument and	
[12]		- 1	acknowledged to me that they executed the same for the	
[13]		[15]	purposes and consideration therein expressed.	
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[25]		_ (1)	CERTIFICATE OF DEPOSITION OFFICER	•
	Page 158	1		
[1]			tor the State of California, do certify:	
	PAGE LINE CHANGE REASON	[4]	That the witness in the foregoing deposition,	
(3)		[5]	was by me first duly sworn to testify the truth, the	
[4]	·	[6]	whole truth and nothing but the truth in the	
[5]	\cdot	[7]	within-antitled cause;	
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(7)		(9)	and place therein stated by me, a Certifled Shorthand	
[8]		[10]	Reporter, and thereafter transcribed into typewriting:	
[9]	·	[11]		
[10]		1	read to or by the said witness, corrected by the witness In all respects desired and duly subscribed by said	
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[19]			LAURA D. FOWLER, CSR, License No. C;7054	
[20]		[55]	Certified Shorthand Reporter for the State	
[21]			of California	
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[23]		[24]	Fig. 1	
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EXHIBIT 7

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EXHIBIT 8

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EXHIBIT 9

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EXHIBIT 10

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Telephony Advisor for Exchange Server 2007

Published: November 1, 2006

Introduction

Deploying Exchange 2007 Unified Messaging (UM) requires integrating Exchange Server 2007 with your organization's existing telephony system. A successful deployment requires careful analysis of your existing telephony infrastructure and proper planning, which can be a significant challenge to Exchange Administrators who have little or no telephony knowledge. To assist your organization in this aspect, we are making available the following planning resources:

ested by Microsoft or Gateway

Vendor Partners

PBX Configuration Notes

Related Links

Top of page

Product Documentation

Downloads Community

Troubleshoot

Deploy Maintain

UM Specialists

International TechCenters

Team. To ensure a smooth transition to Exchange UM from legacy voicemail systems, Microsoft recommends all customers to engage These are Systems Integrators who have received technical training on Exchange UM conducted by Microsoft Exchange Engineering the assistance of the UM Specialists. For contact information, visit here

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Exchange Server 2003

Product Versions Exchange Server 2007

Top 10 Questions You need to Answer

Prior to engaging the UM Specialists, you should have ready the answers to the 10 most-commonly-asked questions listed below. This is to facilitate the interaction between you and the UM Specialist. 1.How many existing phone and/or voicemail users are there in your organization and how many users do you intend to provide with Exchange 2007 UM?

2.Which PBX(s) do you intend to use for integration with Exchange 2007 UM?

3.How many PBX(s) does your organization have? Please specify the vendors, types (circuit- or IP-based), models and firmware

4.Are the PBXs networked? Are they centralized or located in multiple locations?

5.What voicemail system(s) is your organization currently using? Please specify the vendors, types, models and firmware versions.

6.How are the voicemail system(s) integrated into your PBX(s) (Analog, T1/E1, PRI, Digital set emulation, VoIP etc)?

7.Are you currently using voice networking?

8.What fax service(s) is your organization using? Does the fax system(s) support inbound fax routing to Exchange?

9.Are you using Automated Attendant system(s)?

10.Do you require support for phone-only users (i.e., no email)?

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Supported VoIP Gateways

Exchange 2007 UM). Currently, there are two vendors and several models of VoIP gateways that have been tested and are supported Integrating Exchange 2007 UM with TDM-based PBXs requires the use of VoIP gateway(s) to translate the media and signaling data between circuit-switched protocol formats (understood by TDM-based PBXs) and IP-based, packet-switched formats (understood by for Exchange 2007 UM, including:

Vendor AudioCodes	Model	Supported Protocols *Analog with In-Band DTMF
		*Analog with SMDI
AudioCodes	Mediant 2000	oTJ/E1/CAS oTJ/E1 Q:SIG
Dialogic		*Digital Set Emulation
Dialogic	PIMGBOLS	*Analog with In-Band DTME *Analog with SMDI
Dialogic	TIMG300DTI, TIMG600DTI	€T1 CAS
		•T1/E1 Q.SIG

For more information about AudioCodes MP-114/8 FXO gateways, visit AudioCodes website.

For more information about AudioCodes Mediant gateways, visit AudioCodes website.

For more information on Dialogic gateways, visit Dialogic website.

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Supported PBXs

http://www.microsoft.com/technet/prodtechnol/exchange/telephony-advisor.mspx (2 of 6)6/23/2007 8:15:41 AM

Case 1:07-cv-00090-SLR

The following PBXs are supported through AudioCodes gateways (MediaPack-114 FXO, MediaPack-118 FXO and Mediant 2000).

PBX Manufacturer	PBX Model/Type	AudioCodes model "x" - replace with 4 or 8 per
		need "y" – replace with 1, 2, 4, 8 or 16 per need
Alcatel	OmniPCX 4400	MediaPack 11x/FXO/AC/SIP-0
		Mediant2000/ySpans/SIP
Astra	M10008 M2000 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1	Mediant2000/vSpans/SIP
Avaya	Definity G3	MediaPack 11x/FXO/AC/SIP-0
		Mediant2000/ySpans/SIP
Avaya	MagiX/Merlin	MediaPack 11x/FxO/AC/SIP-0
Avaya	58300	MediaPack 11x/FXO/AC/SIP-0
		Mediant2000/ySpans/SIP
Avaya	58700 60 60 60 60 60 60 60 60 60 60 60 60 6	MediaPack 11x/FXO/AC/SIP-0
		Mediant2000/ySpans/SIP
Avaya	IP Office	MediaPack 11x/FXO/AC/SIP-0
		Mediant2000/ySpans/SIP
		MediaPack 11x/FXO/AC/SIP-0
NEC	NEAX2400	MediaPack 11x/FXO/AC/SIP-0
		Mediant2000/ySpans/SIP/RS232
Norte	CS-1000M, 1000S, 1000E	Mediant2000/ySpans/SIP
Nortel	Option 81c	Mediant2000/ySpans/SIP
Panasonic	KX-TES824, KX-TEA308	MedjaPack-11x/FXO/AC/SIP-0
Panasonic	KX-TDA30, KX-TDA100, KX-TDA200, KX- TDA600	MediaPack 11x/FXO/AC/SIP-0
Siemens	HCom:150E	MediaPack 11x/FXO/AC/SIP-0
Siemens	HiPath 3550	MediaPack 11x/FXO/AC/SIP-0
Siemens	HiPath 4000	MediaPack 11x/FXO/AC/SIP-0 Mediant2000/ySpans/SIP
Tadiran Telecom	Coral	MediaPack 11x/FXO/AC/SIP-0 Mediant2000/vSpans/SIP
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The following PBXs are supported through the Dialogic® PBX IP Media Gateway (PIMG). When an analog PIMG is used, supplemental signaling (RS232 SMDI, MD110 or MCI protocols, or Inband DTMF signaling) is required.

PIMG.Model and additional signaling	PIMG80DNI	00 PIMGBOMTLDNI	Meridian 11 Option 11, 21, 214, 51, 61, 71 and PIMGBODNI 81. Meridian SL1 - Generic X11, Release 15 or greater Nortel Communication Server - 1000M; 10005, 1000E with Ris V3,0 or greater SL 100 Analog connectivity using SMDI serial protocol
PBX Manufacturer, PBX Model/Type Alcatel Omni PCX 4400	Definity G3:S8100, S8300, S8700, & S8710 PIMG80DNI (Communications Mgr SW V2.0 or greater)	SX-200D, SX-200 Light, SX-2000 Light, SX-2000 PIMGB0MTLDNI S, SX-2000 VS, SX-200 ICP	Meridian 1 = Option 11, 21, 21A, 51, 61, 71, and 81, Meridian SL1 = Generic X11, Release 15 or greater. Nortel Communication Server - 1000M, 1000S, 1000E with Ris V3.0 or greater. SL 100
PBX Manufacturer Alcatel	Avaya	Mitel	Nortel Nortel

2007
Server
Exchange
for
Advisor
Telephony

NEC	2000, 2400, 2400 IPX	PIMG80DNI
Siemens	HiCom 300E CS	PIMG80DNI
Semens	HICOM 300E (European)	PIMG80LS
		Analog connectivity using Inband DTMF: Signaling:
Siemens/ROLM	8000 (SW release 80003 or greater)	PIMG80RLMDNI
	9000 (All versions)	
	9751 (All version of SW release 9005)	
	9751 (SW release 9006.4 or greater)	
Siemens	HIPath 4000	PIMG80.S
Ericsson	MD110	PINGS0LS
		Analog connectivity using the MD110 RS232
		protocol
Intecom		PIMG800LS
		Analog connectivity using SMDI serial protocol
Toshiba	CTX (SW version AR1ME021.00)	PIMG80LS
Others	Aarious	PIMG80LS
		Analog connectivity using either Inband DTMF

The following PBXs are supported through the Dialogic® T1/E1 Media Gateway (TIMG). The gateway, which comes in single span (TIMG300DTIQ), dual span (TIMG600DTIQ) or quad span (TIMG1200DTIQ) densities, supports the following protocols:

. T1 CAS

T1 QSIG

E1 QSIG

QSIG signaling is used, the PBX must support the supplemental services associated with Call Party Information and the Call Transfer capabilities required by Exchange 2007 UM. If CAS signaling is used, supplemental signaling (RS232 SMDI, MD110 or MCI protocols, or Inband DTMF signaling) is required. If

PBX:Manufacturer	BX: Manufacturer PBX: Model/Type	Required Software Version Protocol and additional signaling Version 3.2.712.5 T1 QSIG	Protocol and additional signaling 11 osig
Avaya	Definity G3	3	TI CAS
Avaya		Manager SW V2.0 or greater T1 C	CAS
		E	1 QSIG
		E1 (E1 QSIG
Nortel	Meridian 1 - Option 11 Release 15 or greater, and	Release 15 or greater, and	T 0SIG
	A CONTROL OF THE CONT	ppuons 19 and 40 are required	ではない。 「「「「「「「」」」」というでは、「」」というできます。 「」」」「「」」」というでは、「」」」というでは、「」」というできます。 「「」」」というできます。 「「」」というできます。 「」 「」」というできます。 「」
Norte	s Server 1000	/ersion 2121, Release 4 T1 (T1 QSIG
Ů.	2400 IMX	Release 5200 Dec. 92 1b or CAS (w/ MCI serial protocol)	; (w/ MCI serial protocol)
		greater	
NEC	2400 IPX	ase 03,46,001	T1 QSIG

2007
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Advisor
Telephony

T CAS	T1 QSIG E1 QSIG	T1 0SIG	TI QSIG EI QSIG	CAS (w/ SMDI serial protocol)
	日日	F	FI	Ş
Release 9006.4 or greater (Note: North American Software load only)		[W 34		A MARIA SECTION AND THE SECTIO
HiCom 300E.CS		SX-2000 S, SX-2000 VS	3300	The second secon
Siemens	Siemens	MICE	Mitel	Intecom

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Supported IP-PBXs

The following PBXs are supported through direct SIP connection with Exchange Server 2007 UM.

Required Software Version	5.0, 5.1	2.4	7.1 UR2
PBX Model/Type	CallManager	itelligence : Customer Interaction Center	
PBXManufacturer	Cisco	Interactive Intelligence	MITCH

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PBX Configuration Notes

configuration note. Each PBX configuration note contains information about deploying Exchange 2007 UM with a particular PBX, Since PBXs are so diverse and proprietary, PBX planning is probably the most difficult pre-deployment task. To assist you in this planning, we are making available these PBX configuration notes for your reference. You can use them to help decide if Exchange 2007 UM is the appropriate solution for your organization. In each PBX configuration notes, you will find the following: When Microsoft or another company installs Exchange 2007 UM with a new PBX, the installation is documented into a standardized

The VoIP gateway, if any, required for this deployment,

Authors - individuals or companies that participated in creating this configuration note,

Detailed pre-requisites to this deployment, including:

Features that need to be enabled/disabled on the PBX,

Specialized PBX hardware that needs to be installed,

Features that need to be present on the VoIP gateway, and

Specific cabling requirements between the PBX and the VoIP gateway,

• Exchange UM feature limitations (a list of UM features that are not available with a particular PBX configuration).

For the list of available configuration notes, see:

PBX Configuration Notes - Tested by Microsoft or Gateway Vendor Partners

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http://www.microsoft.com/technet/prodtechnol/exchange/telephony-advisor.mspx (6 of 6)6/23/2007 8:15:41 AM

EXHIBIT 11

Microsoft Exchange Server 2007 Unified Messaging

PBX Configuration Note:

Alcatel OmniPCX 4400 with AudioCodes MP-11x

FXO using Analog lines (In-band DTMF)

Ву

: AudioCodes

Updated Since: 2007-02-09

READ THIS BEFORE YOU PROCEED

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Content

This document describes the configuration required to setup Alcatel OmniPCX 4400 and AudioCodes MP-11x FXO using analog lines with inband DTMF as the telephony signaling protocol. It also contains the results of the interoperability testing of Microsoft Exchange 2007 Unified Messaging based on this setup.

Intended Audience

This document is intended for Systems Integrators with significant telephony knowledge.

Technical Support

The information contained within this document has been provided by Microsoft, its partners or equipment manufacturers and is provided AS IS. This document contains information about how to modify the configuration of your PBX or VoIP gateway. Improper configuration may result in the loss of service of the PBX or gateway. Microsoft is unable to provide support or assistance with the configuration or troubleshooting of components described within. Microsoft recommends readers to engage the service of an Microsoft Exchange 2007 Unified Messaging Specialist or the manufacturers of the equipment(s) described within to assist with the planning and deployment of Exchange Unified Messaging.

Microsoft Exchange 2007 Unified Messaging (UM) Specialists

These are Systems Integrators who have attended technical training on Exchange 2007 Unified Messaging conducted by Microsoft Exchange Engineering Team. For contact information, visit here.

Version Information

Date of Modification	Details of Modification	·
21 March 2007	Version 1	

1. Components Information

1.1. PBX or IP-PBX

PBX Vendor	Alacatel	
Model	OmniPCX 4400	
Software Version	R4.2-d2.304-4-h-il-c6s2	
Telephony Signaling	Analog In-band DTMF Tones	
Additional Notes	None	

1.2. VoIP Gateway

Gateway Vendor	AudioCodes	
Model	MP-11x FXO (MP-114 / MP-118)	
Software Version	5.0	
VoIP Protocol	SIP	

1.3. Microsoft Exchange Server 2007 Unified Messaging

2. Prerequisites

2.1. Gateway Prerequisites

The gateway also supports TLS (in addition to TCP). This provides security by enabling the encryption of SIP packets over the IP network.

2.2. PBX Prerequisites

The PBX hardware must be installed with an Analog Line Interface Card (Z12, Z24, Z32).

2.3. Cabling Requirements

This integration uses standard RJ-11 telephone line cords.

		ary.				

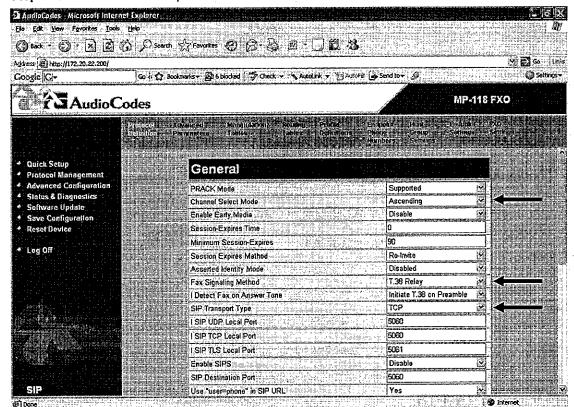
A check in this box indicates the UM feature set is fully functional when using the PBX/gateway in question.

Alcatel OmniPCX 4400 PBX has several limitations when activating the voice mail functionality. The list below describes these PBX's limitations:

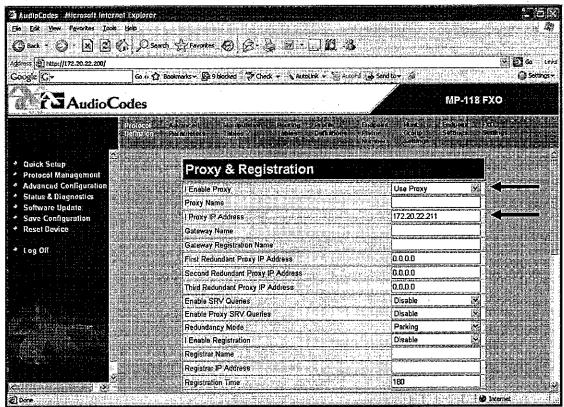
- The PBX doesn't support the sending of the calling user number for direct calls (i.e., user calls UM to retrieve voice message). Therefore, when the user dials directly to the Microsoft Unified Messaging, the user hears the general welcome prompt: "Welcome, you are connected to Microsoft Exchange, to access your mailbox, enter your extension.", at which the user is required to enter the user's extension number in addition to the pin number.
- When performing blind transfer to an invalid number, the PBX doesn't support invalid number notification and the call is routed back to the original transfer user. When an invalid extension number is defined in the Microsoft Unified Messaging for a particular user, and call transfer by Directory Search to this user is requested, the user that requests this transfer is routed back to the Microsoft Unified Messaging welcome prompt.

4. Gateway Setup Notes

Step 1: SIP Environment Setup

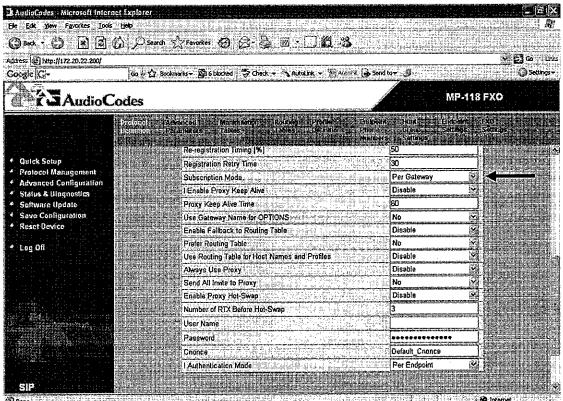


Step 2: Routing Setup

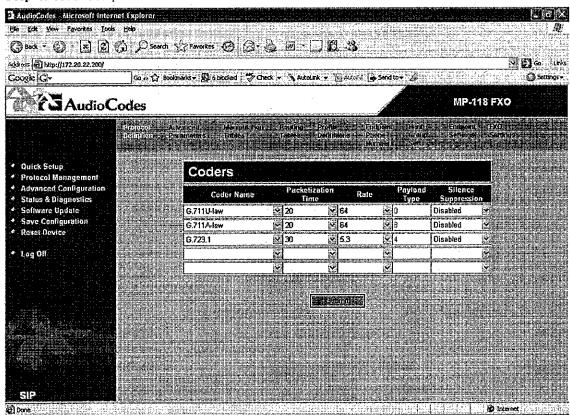


Note: The Proxy IP Address must be one that corresponds to the network environment in which the Microsoft Unified Messaging server is installed (For example, 172.20.22.211 or the FQDN of the Microsoft Unified Messaging host).

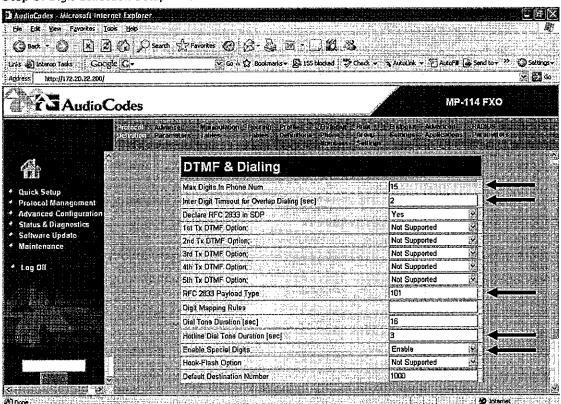
Step 3: SIP Environment Setup (Cont.)



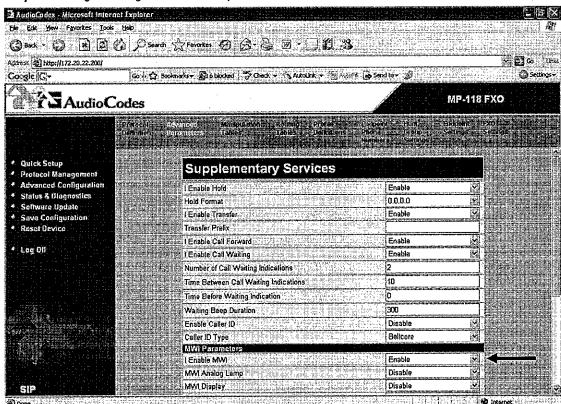
Step 4: Coder Setup



Step 5: Digit Collection Setup

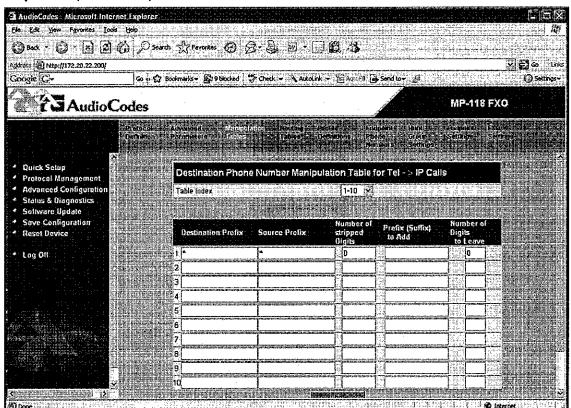


Step 6: Message Waiting Indication Setup



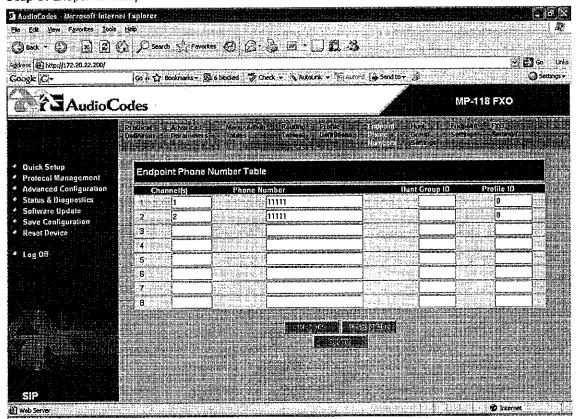
(Page 11 of 61)

Step 7: Manipulation Setup



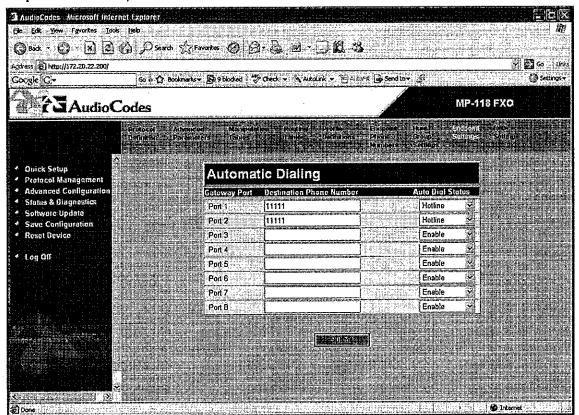
(Page 12 of 61)

Step 8: Endpoints Setup



Note: The phone numbers must correspond to your network environment as the dial plan pilot number is configured for this PBX in the Microsoft Unified Messaging server (For example, 11111).

Step 9: Hot Line Setup



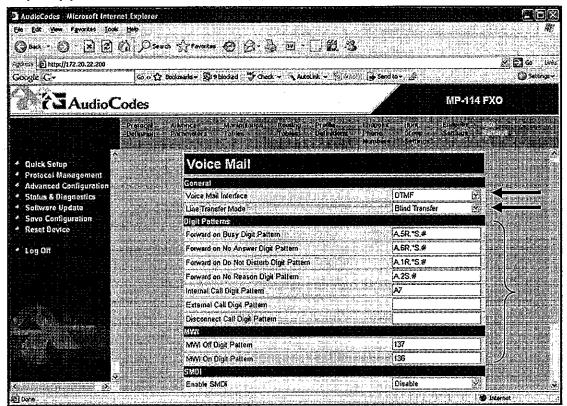
Step 10: Voice mail In-Band DTMF Setup

There are two options to setup the voice mail In-Band DTMF:

- If the current Alacatel OnmiPCX 4400 software package supports Caller ID for voice mail extensions (CLIP on VPS SL), follow Step 10 (a).
- If the current Alacatel OnmiPCX 4400 software package does not support Caller ID for voice mail extensions (CLIP on VPS SL), follow Step 10 (b).

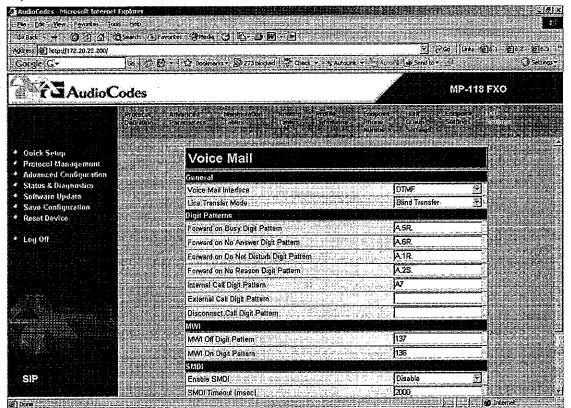
To verify whether or not your PBX supports this package, check steps 18 through 21 in Chapter 7.

Step 10 (a): Voice mail In-Band DTMF Setup (PBX software package supports CLIP on VPS SL)

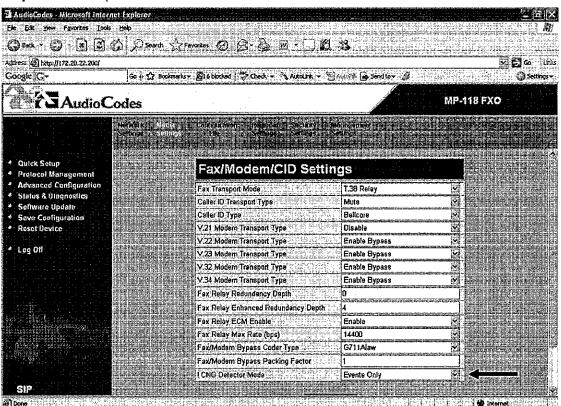


(Page 15 of 61)

Step 10 (b): Voice mail In-Band DTMF Setup (PBX software package does not support CLIP on VPS SL)



Step 11: FAX Setup



Step 12: FXO General Setup

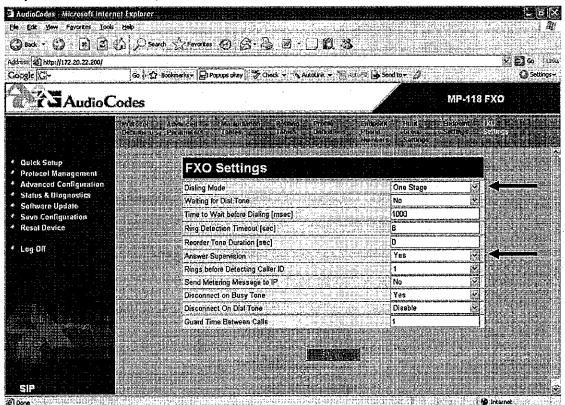
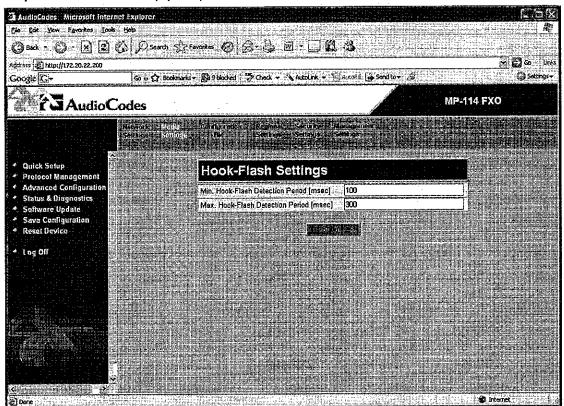
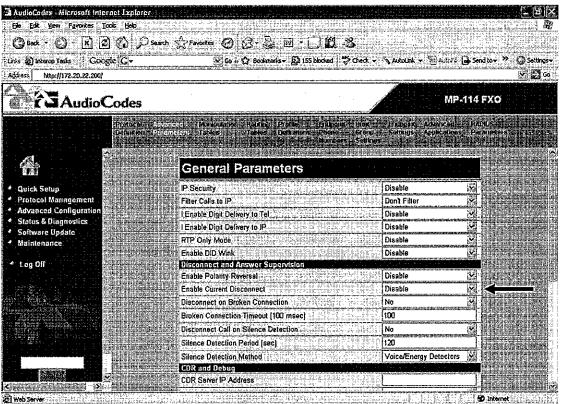


EXHIBIT 11 (Continuted)

Step 13: FXO General Setup (Cont.)



Step 14: FXO General Setup (Cont.)



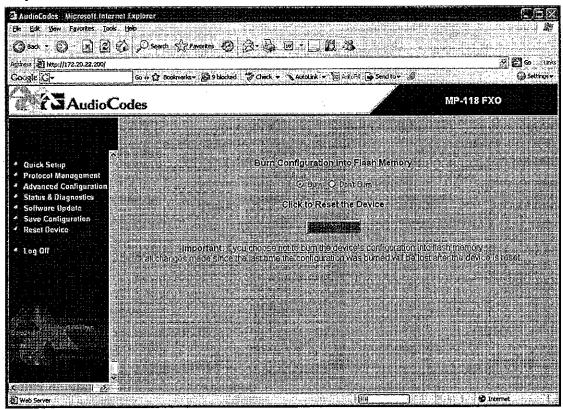
Step 15: FXO General Setup (Cont.)

CallProgressTonesFilename = 'CPT alcatel_omnipcx.dat'

EnableDetectRemoteMACChange = 2

ECNLPMode = 1

Step 16: Reset FXO

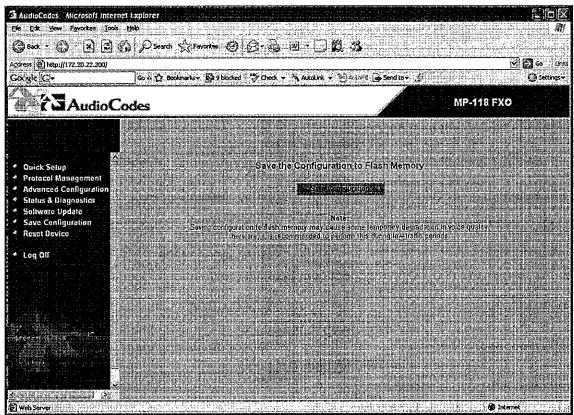


Note: Steps 1 and 7 involve core configuration changes (versus default settings):

- Proxy IP Address (Microsoft Unified Messaging IP address)
- Enabling Message Waiting process

These changes require a gateway reset (by default, when performing a gateway reset, the configuration is burnt to flash memory). If no change is made to these two core configuration parameters, skip to Step 17.

Step 17: Save Gateway Configuration



Note: This step is optional and is note required if you performed Step 16.

4.1. Configuration Files

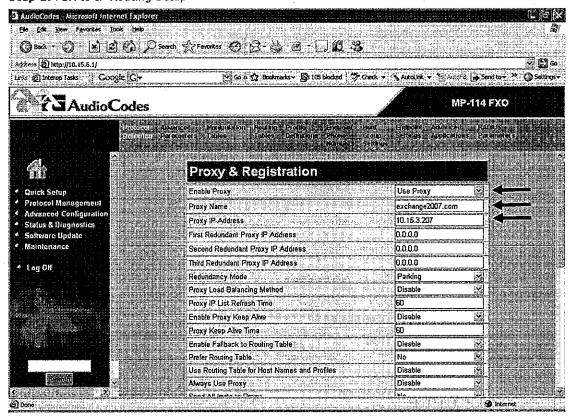
The ZIP file includes the following files:

- Audiocodes configuration ini file for PBXs that support Caller ID for voice mail extensions (INI Alcatel OmniPCX4400 FXO DTMF - PBX Caller id enabled ini).
- Audiocodes configuration ini file for PBXs that do not support Caller ID for voice mail extensions (INI Alcatel OmniPCX4400 FXO DTMF - PBX Caller id disabled.ini).
- Audiocodes Call Progress Tones file for Alcatel OmniPCX 4400 PBX (.dat file extension).



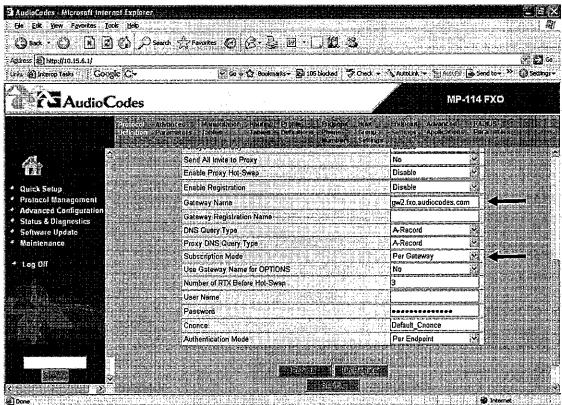
4.2. TLS Setup

Step 1: PBX to IP Routing Setup



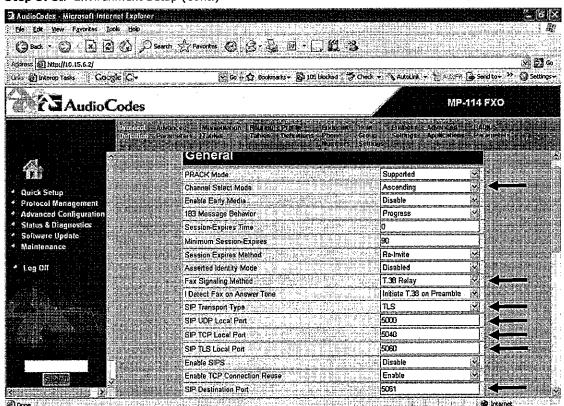
Note: The Proxy IP Address and Name must be one that corresponds to the network environment in which the Microsoft Unified Messaging server is installed (For example, 10.15.3.207 for IP Address and exchange 2007.com for the FQDN of the Microsoft Unified Messaging host).

Step 2: SIP Environment and Gateway Name Setup



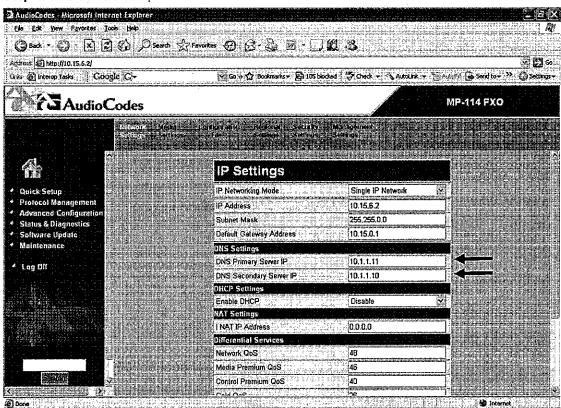
Note: Assign an FQDN name to the gateway (for example, gw2.fxoaudiocodes.com). Any gateway name that corresponds to your network environment is applicable; the only limitation is not to include underscores in the name (Windows Certification server limitation).

Step 3: SIP Environment Setup (Cont.)

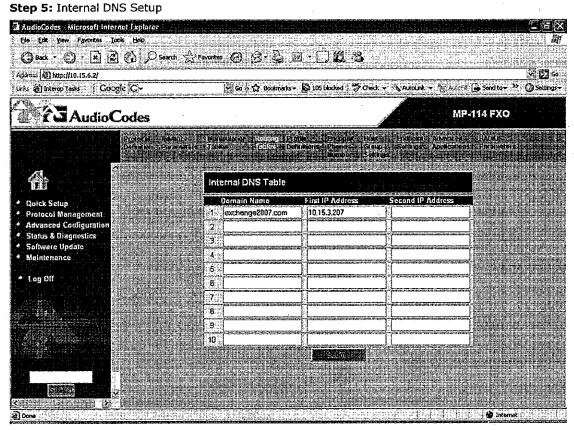


(Page 26 of 61)

Step 4: DNS Servers Setup

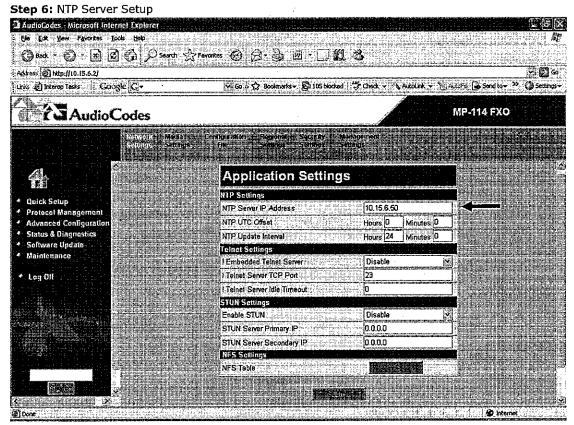


Note: Define the primary and secondary DNS servers' IP addresses so that they correspond to your network environment (for example, 10.1.1.11 and 10.1.1.10). If no DNS server is available in the network, then skip this step.



Note: If no DNS server is available in the network, define the internal DNS table where the domain name is the FQDN of the Microsoft Unified Messaging server and the First IP Address corresponds to its IP address (for example, exchange2007.com and 10.15.3.207).

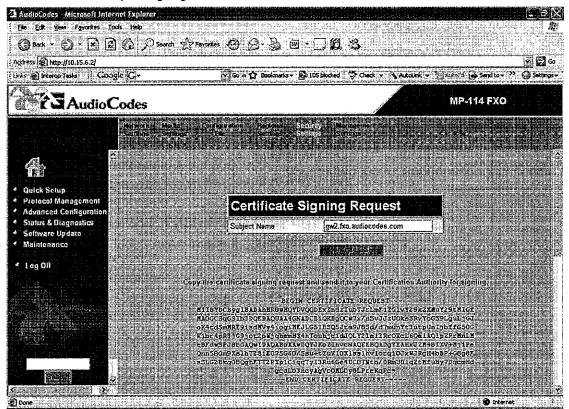
Case 1:07-cv-00090-SLR



Note: Define the NTP server's IP address so that it corresponds to your network environment (for example, 10.15.3.50). If no NTP server is available in the network, then skip this step (as the gateway uses it's internal clock).

Step 7: Generate Certificate Setup

Use the screen below to generate CSR. Copy the certificate signing request and send it to your Certification Authority for signing.

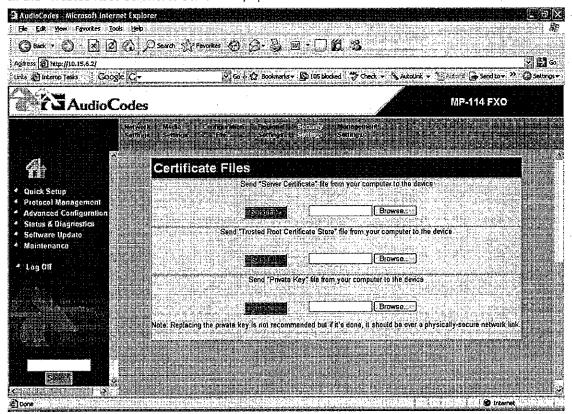


Step 8: Uploading Certificates Setup

The screen below is used to upload the sign certificates.

In the "Server Certificate" area, upload the gateway certificate signed by the CA.

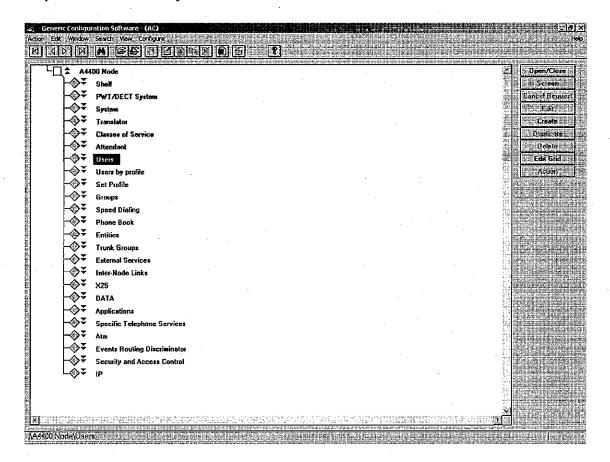
In the "Trusted Root Certificate Store" area, upload the CA certificate.



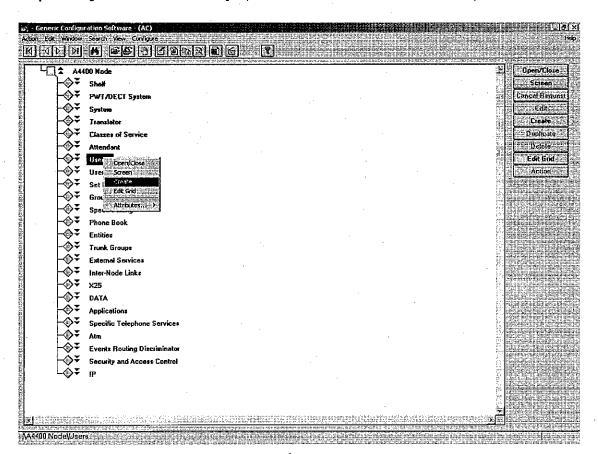
5. PBX Setup Notes

Configuring Voice Mail extensions

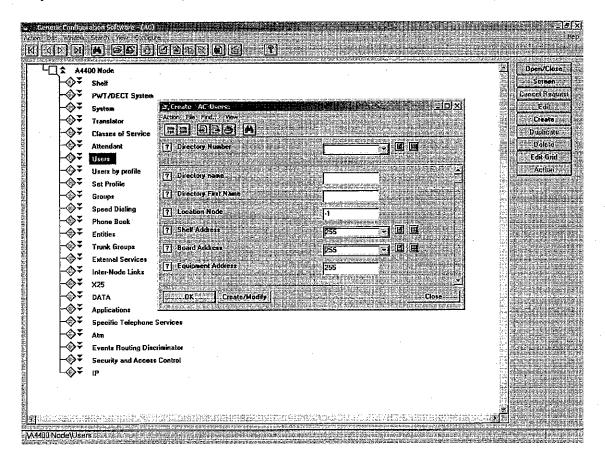
Step 1: Select the Users object.



Step 2: Right-click the Users object, and then from the shortcut menu, choose Create.

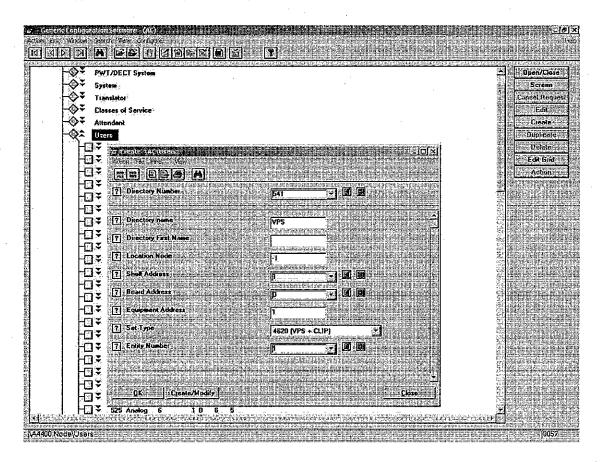


Step 3: The Create window opens.



Step 4: In the Create window, fill in the following fields:

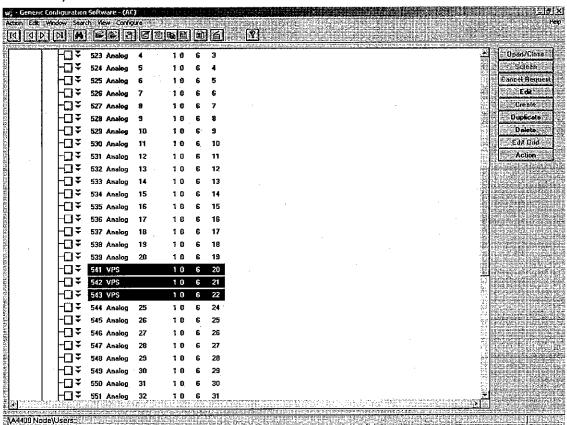
- Directory Number: Free extension number in the PBX, for example, 541,542.
- Directory Name: Unique name for this group in the PBX, for example, VPS.
- Shelf Address, Board Address, and Equipment Address: Fill in the physical location of the extension in the PBX.
- Set Type: must be 4620 (VPS + CLIP).



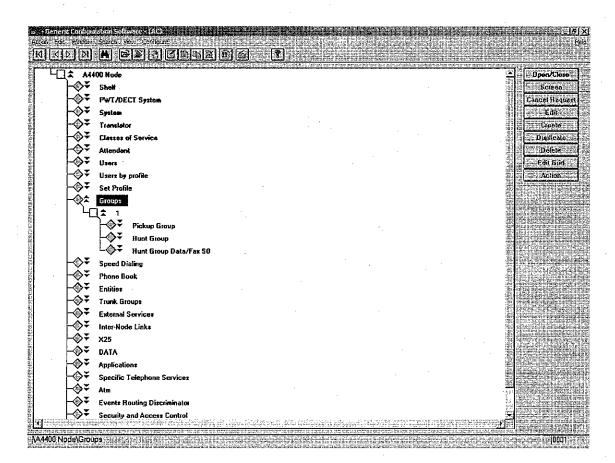
Step 5: Click the Create/Modify button.

Step 6: Repeat steps 2 through 5 for as many Voice-Mail access extension that are needed.

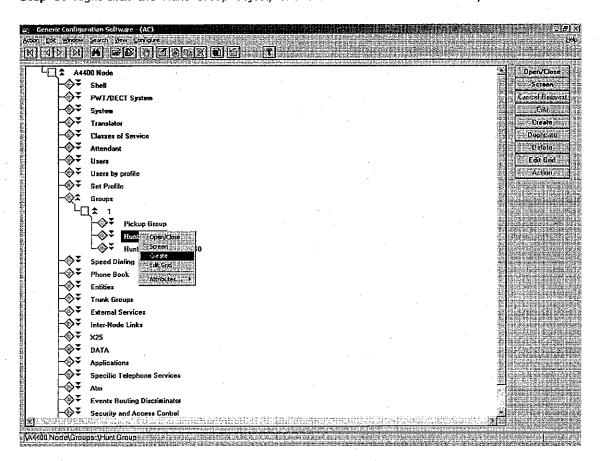
Step 7: After you have finished creating all the required Voice-Mail access extensions, double-click the Users object. The full users/extensions list of the PBX appears. Scroll down the list until you see the users that you defined.



Step 8: In the main menu, double-click the Groups object. A list of the available groups in the PBX are shown.



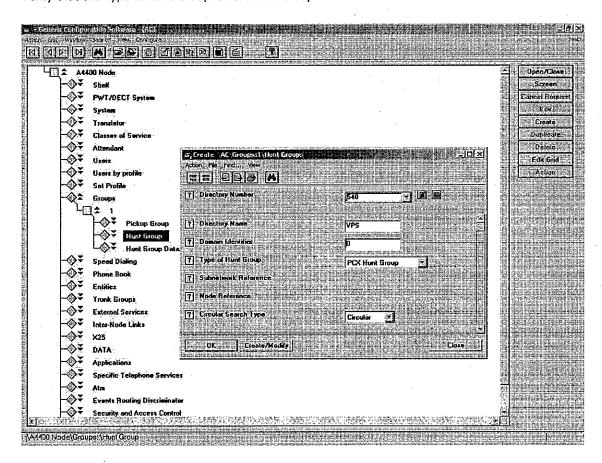
Step 9: Right-click the Hunt Group object, and then from the shortcut menu, choose Create.



Step 10: In the opened Create window, enter the following:

- Directory Number: Unique hunt group number in the PBX, for example, 540.
- Directory Name: Unique hunt group name in the PBX, for example, VPS.

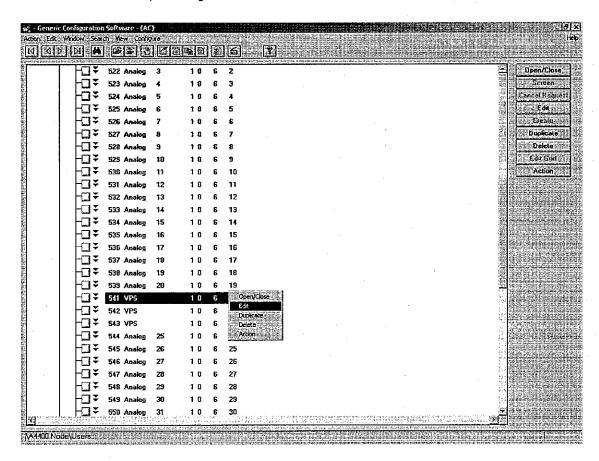
Verify that the Type of Hunt Group is PBX Hunt Group.



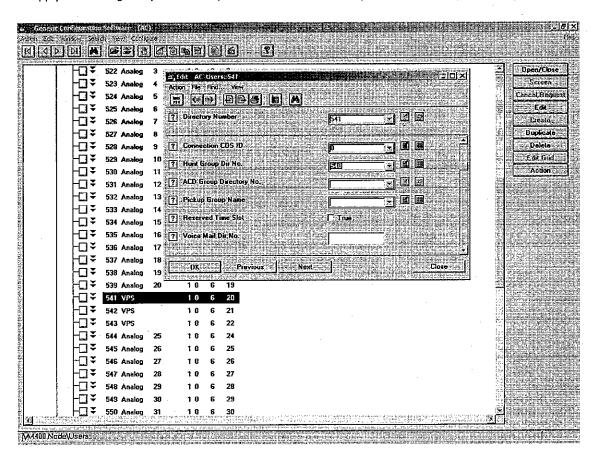
Step 11: When you have completed defining the Hunt Group, click Create/Modify.

EXHIBIT 11 (Continuted)

Step 12: Click the Users object. The full users/extensions list of the PBX appears. Scroll down the list until you see the users that you defined. Access each of the users by right-clicking the user, and then from the shortcut menu, choosing Edit.

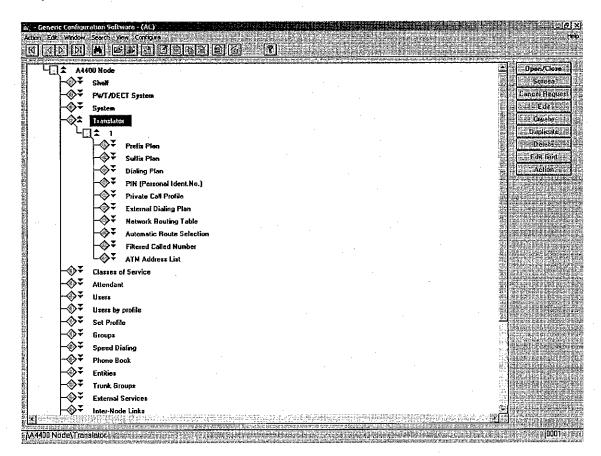


Step 13: In the Edit window, scroll down until the Hunt Group Dir No. field is visible. In this field, enter the Directory Number of the hunt group that you defined in Step 10, for example, 540. Click **OK** to apply the settings. Repeat this step for each voice mail user you defined in steps 2 through 5.

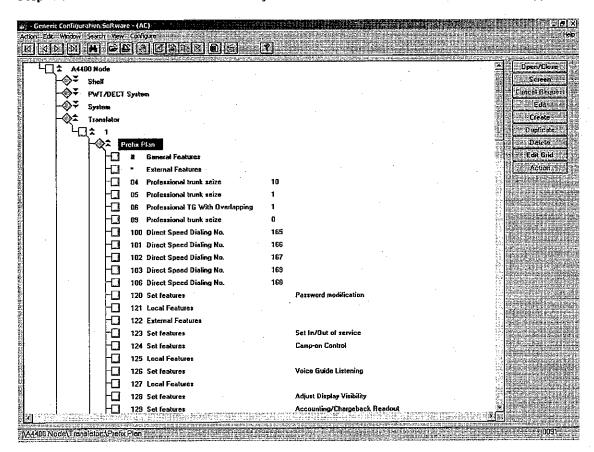


Configuring Message Waiting Indication

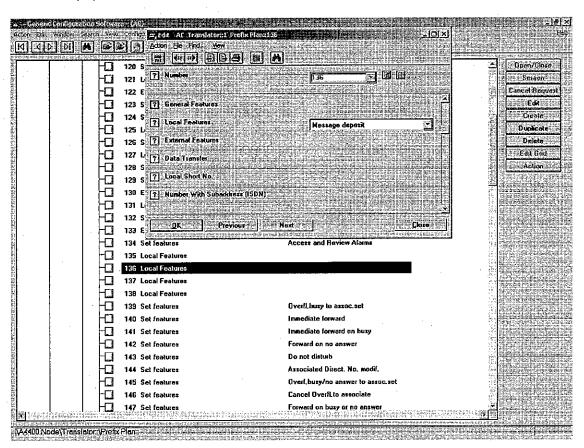
Step 14: In the main menu, double-click the Translator object.



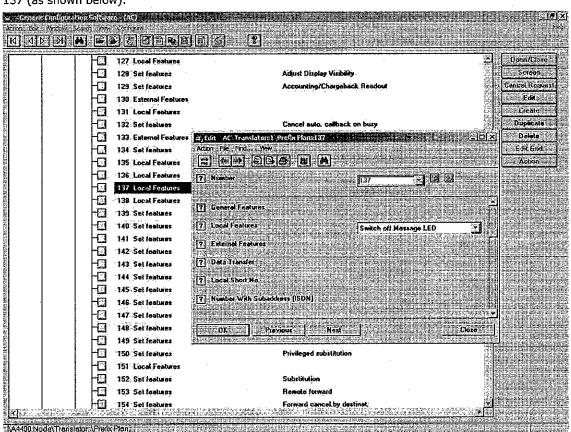
Step 15: Double-click the Prefix Plan object. A list of all the feature access codes appears.



Step 16: Verify the feature access code (Number) for the Local Feature of the type Message Deposit. Perform this by right-clicking each feature in the list, and then from the shortcut menu, choosing **Edit**. For example, the feature access code number is 136 (as shown below).

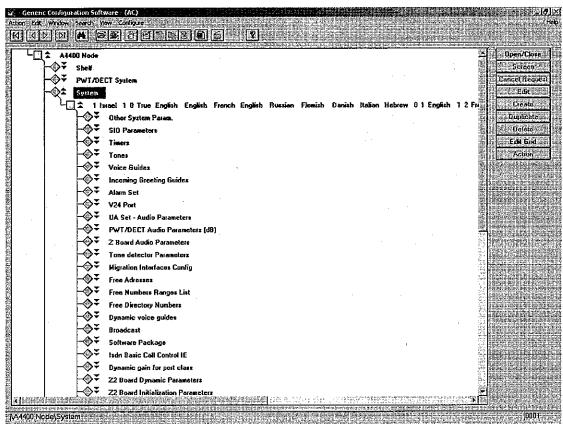


Step 17: In the same list of feature access codes, verify the feature access code (Number) for the Local Feature of the type Switch off Message LED. Perform this by right-clicking each feature in the list, and then from the shortcut menu, choosing Edit. For example, the feature access code number is 137 (as shown below).

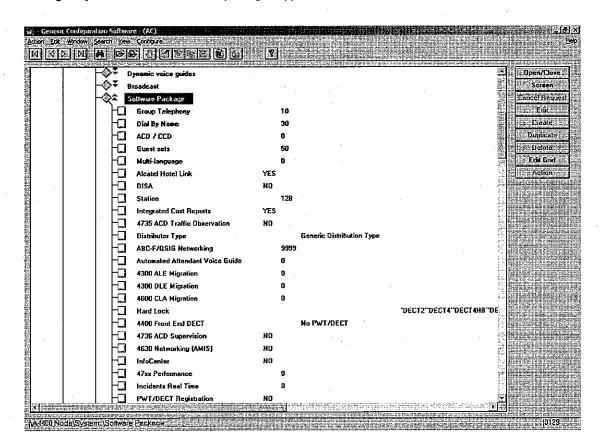


Verify whether or not the PBX supports Caller ID for Voice Mail extensions

Step 18: In the main menu, double-click the System object. A list of the available system parameters in the PBX is shown.



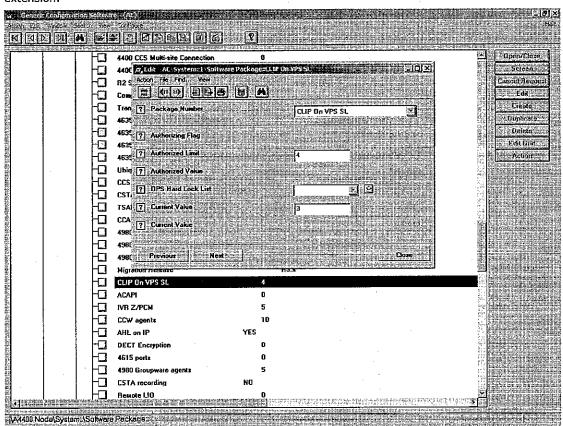
Step 19: Scroll down the list until you see the Software Package object. Double-click the Software Package object. A list of all software packages appears.



Step 20: Scroll down the list until you see the CLIP on VPS SL object. To verify the availability of Caller ID for the voice mail extensions, right-click the object, and then from the shortcut menu, choose Edit.

<u>ৰিচিমি</u>				
	15	4980 Nomadic Agents Logged in	0	∑ j j j j j j j j j j j j j j j j j j j
		Migration Roleage	. A3.x	Statem
		CEIP On VPS SI. ESE ACAPI	<u></u>	F Its Constitution
		IVR Z/PCM	5	SAN CHARLES
		CCW agents	9 16	All Depresie
		AHL on IP	YES	tialote!
		DECT Encryption	0	Edit tild
		4615 ports	n	Cal Ación
		4980 Groupware agents	5	a december
	Ho	CSTA recording	но	2 April 2 13
1		Remote LIO	0	
1	-	Voice on IP	8	
1	la	Moderated conference	HO	
		Multiple Companies	Ó	
		G729 Algorithm	15	
		Priority	NO	
		Call Restriction	NO	
		IP Terminals	10	
	-0	Release R3.1	YES	
		TAPI Premium Server	10	国络铁铁镇
		Bit Channel Recording	D .	i l aterie en
		MATU	NÖ ,	
	0	IP Device	7	
	 	IP Call Server	YES	
		4900 Dispatcher		
1	-0	4635 VPIN	0	

Step 21: In the Edit window, verify the value in the Authorized Limit field. This value displays the total amount of voice mail extensions that are authorized to have the Caller ID feature. If the value of this field is zero (0), the PBX's software package does not support Caller ID for the voice mail extension



5.1. TLS Setup

• N/A.

5.2. Fail-Over Configuration

N/A.

5.3. Tested Phones

Alcatel Advanced Reflexes.

5.4. Other Comments

None.

6. Exchange 2007 UM Validation Test Matrix

The following table contains a set of tests for assessing the functionality of the UM core feature set. The results are recorded as either:

- Pass (P)
- Conditional Pass (CP)
- Fail (F)
- Not Tested (NT)
- Not Applicable (NA)

Refer to:

- Appendix for a more detailed description of how to perform each call scenario.
- Section 6.1 for detailed descriptions of call scenario failures, if any.

No.	Call Scenarios (see appendix for more detailed instructions)	(P/CP/F/NT)	Reason for Failure (see 6.1 for more detailed descriptions)
1	Dial the pilot number from a phone extension that is NOT enabled for Unified Messaging and logon to a user's mallbox.	Р	
	Confirm hearing the prompt: "Welcome, you are connected to Microsoft Exchange. To access your mailbox, enter your extension"	·	
2	Navigate mailbox using the Voice User Interface (VUI).	P	
з	Navigate mailbox using the Telephony User Interface (TUI).	Ď	
4	Dial user extension and leave a voicemail.		TANK CAMPANIAN CAMPANIAN CAMPANIAN
4a	Dial user extension and leave a voicemail from an internal extension.	р	
	Confirm the Active Directory name of the calling party is displayed in the sender field of the voicemail message.		
4b	Dial user extension and leave a voicemail from an external phone.	P	
	Confirm the correct phone number of the calling party is displayed in the sender field of the voicemail message.		
5	Dial Auto Attendant (AA).	p	

	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·
	Dial the extension for the AA and confirm the AA answers the call.		
6	Call Transfer by Directory Search.	richinanikasi mantan	
6a	Call Transfer by Directory Search and have the called party answer.	þ	
	Confirm the correct called party answers the phone.		·
6b	Call Transfer by Directory Search when the called party's phone is busy.	, p	
	Confirm the call is routed to the called party's voicemail.		
6c	Call Transfer by Directory Search when the called party does not answer.	p	·
	Confirm the call is routed to the called party's voicemail.		
6d	Setup an invalid extension number for a particular user. Call Transfer by Directory Search to this user.	СР	The Alcatel OmniPCX doesn't support invalid number notification and the call is routed back to the Microsoft Unified Messaging welcome prompt.
	Confirm the number is reported as invalid.		
7	Outlook Web Access (OWA) Play-On- Phone Feature.		
7a	Listen to voicemail using OWA's Play-On- Phone feature to a user's extension.	P	
7b	Listen to voicemail using OWA's Play-On- Phone feature to an external number.	35	
8	Configure a button on the phone of a UM- enabled user to forward the user to the pilot number. Press the voicemail button.	СР	Due to PBX limitation, the user is requested to not only enter the pin number, but also the extension number.
	Confirm you are sent to the prompt: "Welcome, you are connected to Microsoft Exchange. <user>. Please enter your pin and press the pound key."</user>		
9	Send a test FAX message to user extension.	P	

			· · · · · · · · · · · · · · · · · · ·
	Confirm the FAX is received in the user's inbox.		
10	Setup TLS between gateway/IP-PBX and Exchange UM.		Company of the Compan
	Windows Certificate Authority (CA).		
10a	Dial the pilot number and logon to a user's mailbox.	p .	
	Confirm UM answers the call and confirm UM responds to DTMF input.		
10b	Dial a user extension and leave a voicemail.	p	
	Confirm the user receives the voicemail.		
10c	Send a test FAX message to user extension.	₽ ·	
	Confirm the FAX is received in the user's inbox.		
11	Setup G.723.1 on the gateway. (If already using G.723.1, setup G.711 A Law or G.711 Mu Law for this step).	F	
	Dial the pilot number and confirm the UM system answers the call.		
12	Setup Message Waiting Indicator (MWI).	P	
	Geomant offers a third party solution: MWI 2007. Installation files and product documentation can be found on Geomant's <u>MWI 2007 website</u> .		
13	Execute Test-UMConnectivity.	NT	
14	Setup and test fail-over configuration on the IP-PBX to work with two UM servers.	NA	

6.1. Detailed Description of Limitations

Failure Point	The Alcatel OmniPCX 4400 PBX doesn't send the calling extension number for direct calls.
Phone type (if phone-specific)	All types
Call scenarios(s) associated with failure point	8
List of UM features affected by failure point	The user is requested to not only enter the pin number, but also the extension number.

Additional Comments

The PBX doesn't support the sending of the calling user number for direct calls (i.e., user calls UM to retrieve voice message). Therefore, when the user dials directly to the Microsoft Unified Messaging, the user hears the general welcome prompt: "Welcome, you are connected to Microsoft Exchange, to access your mailbox, enter your extension.", at which the user is required to enter the user's extension number in addition to the pin number.

Failure Point	The Alcatel OmniPCX 4400 PBX doesn't support invalid number notification.
Phone type (if phone-specific)	All types
Call scenarios(s) associated with failure point	6d
List of UM features affected by failure point	Transfer to a Microsoft Unified Messaging server user's voicemail after transfer to an invalid number of the user.

Additional Comments

When performing blind transfer to an invalid number, the PBX doesn't support invalid number notification and the call is routed back to the original transfer user. When an invalid extension number that's defined in the Microsoft Unified Messaging for a particular user, and a call transfer by Directory Search to this user is requested, the user that requests this transfer is routed back to the Microsoft Unified Messaging welcome prompt.

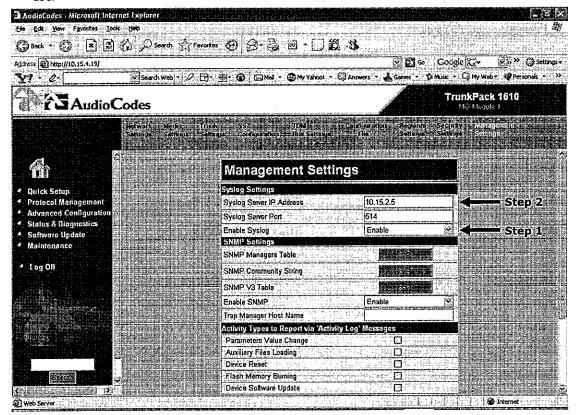
7. Troubleshooting

The tools used for debugging include network sniffer applications (such as Ethereal) and AudioCodes' Syslog protocol.

The Syslog client, embedded in the AudioCodes gateways (MP-11x, Mediant 1000, and Mediant 2000), sends error reports/events generated by the gateway application to a Syslog server, using IP/UDP protocol.

To activate the Syslog client on the AudioCodes gateways:

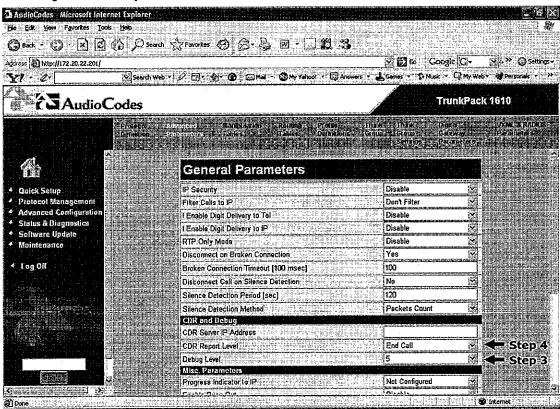
- 1. Set the parameter Enable Syslog to 'Enable'.
- Use the parameter Syslog Server IP Address to define the IP address of the Syslog server you use.



Note: The Syslog Server IP address must be one that corresponds to your network environment in which the Syslog server is installed (for example, 10.15.2.5).

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- 3. To determine the Syslog logging level, use the parameter Debug Level and set this parameter to
- 4. Change the CDR Report Level to 'End Call' to enable additional call information.



AudioCodes has also developed advanced diagnostic tools that may be used for high-level troubleshooting. These tools include the following:

- Call Progress Tone wizard (CPTWizard): helps detect the Call Progress Tones generated by the PBX. The software automatically creates a basic Call Progress Tones file.
- DSP Recording: DSP recording is a procedure used to monitor the DSP operation (e.g., rtp packets and events).

Appendix

1. Dial Pilot Number and Mailbox Login

- Dial the pilot number of the UM server from an extension that is NOT enabled for UM.
- Confirm hearing the greeting prompt: "Welcome, you are connected to Microsoft Exchange. To access your mailbox, enter your extension..."
- Enter the extension, followed by the mailbox PIN of an UM-enabled user.
- Confirm successful logon to the user's mailbox.

2. Navigate Mailbox using Voice User Interface (VUI)

- Logon to a user's UM mailbox.
- If the user preference has been set to DTMF tones, activate the Voice User Interface (VUI)
 under personal options.
- Navigate through the mailbox and try out various voice commands to confirm that the VUI is working properly.
- This test confirms that the RTP is flowing in both directions and speech recognition is working properly.

3. Navigate Mailbox using Telephony User Interface (TUI)

- Logon to a user's UM mailbox.
- If the user preference has been set to voice, press "#0" to activate the Telephony User Interface (TUI).
- Navigate through the mailbox and try out the various key commands to confirm that the TUI is working properly.
- This test confirms that both the voice RTP and DTMF RTP (RFC 2833) are flowing in both directions.

4. Dial User Extension and Leave Voicemail

Note: If you are having difficulty reaching the user's UM voicemail, verify that the coverage
path for the UM-enabled user's phone is set to the pilot number of the UM server.

a. From an Internal Extension

- a. From an internal extension, dial the extension for a UM-enabled user and leave a voicemail message.
- b. Confirm the voicemail message arrives in the called user's inbox.
- Confirm this message displays a valid Active Directory name as the sender of this voicemail.

b. From an External Phone

- a. From an external phone, dial the extension for a UM-enabled user and leave a voicemail message.
- b. Confirm the voicemail message arrives in the called user's inbox.
- c. Confirm this message displays the phone number as the sender of this voicemail.

5. Dial Auto Attendant(AA)

- Create an Auto Attendant using the Exchange Management Console:
 - a. Under the Exchange Management Console, expand "Organizational Configuration" and then click on "Unified Messaging".
 - b. Go to the Auto Attendant tab under the results pane.
 - c. Click on the "New Auto Attendant..." under the action pane to invoke the AA wizard.
 - d. Associate the AA with the appropriate dial plan and assign an extension for the AA.
 - e. Create PBX dialing rules to always forward calls for the AA extension to the UM server.
 - f. Confirm the AA extension is displayed in the diversion information of the SIP Invite.
- Dial the extension of Auto Attendant.
- Confirm the AA answers the call.

6. Call Transfer by Directory Search

- Method one: Pilot Number Access
 - Dial the pilot number for the UM server from a phone that is NOT enabled for UM.
 - To search for a user by name:
 - Press # to be transferred to name Directory Search.
 - Call Transfer by Directory Search by entering the name of a user in the same Dial Plan using the telephone keypad, last name first.
 - To search for a user by email alias:
 - Press "#" to be transferred to name Directory Search
 - Press "# #" to be transferred to email alias Directory Search
 - Call Transfer by Directory Search by entering the email alias of a user in the same Dial Plan using the telephone keypad, last name first.
- · Method two: Auto Attendant
 - Follow the instructions in appendix section 5 to setup the AA.
 - Call Transfer by Directory Search by speaking the name of a user in the same Dial Plan. If the AA is not speech enabled, type in the name using the telephone keypad.

Note: Even though some keys are associated with three or four numbers, for each letter, each
key only needs to be pressed once regardless of the letter you want. Ignore spaces and
symbols when spelling the name or email alias.

a. Called Party Answers

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- Call Transfer by Directory Search to a user in the same dial plan and have the called party answer.
- Confirm the call is transferred successfully.

b. Called Party is Busy

- Call Transfer by Directory Search to a user in the same dial plan when the called party is busy.
- Confirm the calling user is routed to the correct voicemail.

c. Called Party does not Answer

- Call Transfer by Directory Search to a user in the same dial plan and have the called party not answer the call.
- Confirm the calling user is routed to the correct voicemail.

d. The Extension is Invalid

- Assign an invalid extension to a user in the same dial plan. An invalid extension has the same number of digits as the user's dial plan and has not been mapped on the PBX to any user or device.
 - a. UM Enable a user by invoking the "Enable-UMMailbox" wizard.
 - b. Assign an unused extension to the user.
 - c. Do not map the extension on the PBX to any user or device.
 - d. Call Transfer by Directory Search to this user.
 - e. Confirm the call fails and the caller is prompted with appropriate messages.

7. Play-On-Phone

- To access play-on-phone:
 - a. Logon to Outlook Web Access (OWA) by going to URL https://<server name>/owa.
 - b. After receiving a voicemail in the OWA inbox, open this voicemail message.
 - c. At the top of this message, look for the Play-On-Phone field (Play on Phone...).
 - d. Click this field to access the Play-On-Phone feature.

a. To an Internal Extension

- Dial the extension for a UM-enabled user and leave a voicemail message.
- Logon to this called user's mailbox in OWA.

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- Once it is received in the user's inbox, use OWA's Play-On-Phone to dial an internal extension.
- Confirm the voicemail is delivered to the correct internal extension.

b. To an External Phone number

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- Dial the extension for a UM-enabled user and leave a voicemail message.
- Logon to the UM-enabled user's mailbox in OWA.
- Confirm the voicemail is received in the user's mailbox.
- Use OWA's Play-On-Phone to dial an external phone number.
- Confirm the voicemail is delivered to the correct external phone number.
- Troubleshooting:
 - a. Make sure the appropriate UMMailboxPolicy dialing rule is configured to make this call. As an example, open an Exchange Management Shell and type in the following commands:
 - b. \$dp = get-umdialplan -id <dial plan ID>
 - c. \$dp.ConfiguredInCountryOrRegionGroups.Clear()
 - d. \$dp.ConfiguredInCountryOrRegionGroups.Add("anywhere,*,*,")
 - e. \$dp.AllowedInCountryOrRegionGroups.Clear()
 - \$dp.AllowedInCountryOrRegionGroups.Add("anywhere")
 - g. \$dp[set-umdialplan
 - h. \$mp = get-ummailboxpolicy -id <mailbox policy ID>
 - \$mp.AllowedInCountryGroups.Clear()
 - j. \$mp.AllowedInCountryGroups.Add("anywhere")
 - k. \$mp[set-ummailboxpolicy
 - I. The user must be enabled for external dialing on the PBX.
 - m. Depending on how the PBX is configured, you may need to prepend the trunk access code (e.g. 9) to the external phone number.

8. Voicemail Button

- Configure a button on the phone of a UM-enabled user to route the user to the pilot number of the UM server.
- Press this voicemail button on the phone of an UM-enabled user.
- Confirm you are sent to the prompt: "Welcome, you are connected to Microsoft Exchange. <use><User Name>. Please enter your pin and press the pound key."
- Note: If you are not hearing this prompt, verify that the button configured on the phone passes the user's extension as the redirect number. This means that the user extension should appear in the diversion information of the SIP invite.

9. FAX

- Use the Management Console or the Management Shell to FAX-enable a user.
- · Management Console:
 - a. Double click on a user's mailbox and go to Mailbox Features tab.
 - b. Click Unified Messaging and then click the properties button.
 - c. Check the box "Allow faxes to be received".
- Management Shell execute the following command:
 - a. Set-UMMailbox -identity UMUser -FaxEnabled:\$true
- To test fax functionality:
 - a. Dial the extension for this fax-enabled UM user from a fax machine.
 - b. Confirm the fax message is received in the user's inbox.
 - c. Note: You may notice that the UM server answers the call as though it is a voice call (i.e. you will hear: "Please leave a message for..."). When the UM server detects the fax CNG tones, it switches into fax receiving mode, and the voice prompts terminate.
 - d. Note: UM only support T.38 for sending fax.

10.TRANSPORT SECURITY LAYER (TLS)

- Setup TLS on the gateway/IP-PBX and Exchange 2007 UM.
- Import/Export all the appropriate certificates.

a. Dial Pilot Number and Mailbox Login

Execute the steps in scenario 1 (above) with TLS turned on.

b. Dial User Extension and Leave a Voicemail

· Execute the steps in scenario 4 (above) with TLS turned on.

c. FAX

Execute the steps in scenario 9 (above) with TLS turned on.

11.G.723.1

- Configure the gateway to use the G.723.1 codec for sending audio to the UM server.
- If already using G.723.1 for the previous set of tests, use this step to test G.711 A Law or G.711 Mu Law instead.
- Call the pilot number and verify the UM server answers the call.
- Note: If the gateway is configured to use multiple codecs, the UM server, by default, will use the G.723.1 codec if it is available.

12.Message Waiting Indicator (MWI)

- Although Exchange 2007 UM does not natively support MWI, Geomant has created a 3rd party solution - MWI2007. This product also supports SMS message notification.
- Installation files and product documentation can be found on Geomant's <u>MWI 2007 website</u>.

13.Test-UMConnectivity

- Run the Test-UMConnectivity diagnostic cmdlet by executing the following command in Exchange Management Shell:
- Test-UMConnectivity -UMIPGateway: <Gateway> -Phone: <Phone> |fl
- <Gateway> is the name (or IP address) of the gateway which is connected to UM, and through which you want to check the connectivity to the UM server. Make sure the gateway is configured to route calls to UM.
- <Phone> is a valid UM extension. First, try using the UM pilot number for the hunt-group linked to the gateway. Next, try using a CFNA number configured for the gateway. Please ensure that a user or an AA is present on the UM server with that number.
- The output shows the latency and reports if it was successful or there were any errors.

14.Test Fail-Over Configuration on IP-PBX with Two UM Servers

- This is only required for direct SIP integration with IP-PBX. If the IP-PBX supports fail-over configuration (e.g., round-robin calls between two or more UM servers):
 - a. Provide the configuration steps in Section 5.
 - b. Configure the IP-PBX to work with two UM servers.
 - c. Simulate a failure in one UM server.
 - d. Confirm the IP-PBX transfers new calls to the other UM server successfully.

REDACTED

REDACTED

REDACTED

REDACTED

UNITED STATES DISTRICT COURT DISTRICT OF DELAWARE

MICROSOFT CORP., Plaintiff,

ALCATEL-LUCENT ENTERPRISE

and
GENESYS TELECOMMUNICATIONS
LABORATORIES, INC.,
Defendants.

Civil Action No. 07-090-SLR Hon. Sue L. Robinson

SECOND EXPERT REPORT OF WILLIAM H. BECKMANN, PH.D.

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Claims 1 and 20: "A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plarably of communication services"

The Swartz reference does not anticipate any of the asserted claims of the '064 patent because it does not disclose the wrifted messaging system recited in independent claims 1 and 20. Mr. Hyde-Thomson states that Swartz discloses a unified messaging system "because it provides the facilities needed for controlling a variety of communication services, including telephone, email, fax and paging services provided by a host services computer operating under the control of either or both (1) a World Wide Web interface and (2) a telephone interface." [Hyde-Thomson 165.] Mr. Hyde-Thompson further alleges that Swartz discloses a bost processor computer that can forward, receive, retrieve, and store messages from different communication services, such as voicemail, fax and email. [Hyde-Thomson 166.] However, I disagree with the construction of the term "unified messaging system" that Mr. Hyde-Thomson has apparently adopted in his analysis.

As Microsoft proposes, a unified messaging system is a "system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e., in a coordinated manner)." The portions of Swartz that Mr. Hyde-Thomson points to show that the Swartz system "operates as a POP mailbox and SMTP server for receiving and sending email respectively." [See Hyde-Thomson 165-166 (quoting Swartz col.12 ll.20-31).] There is no disclosure of any additional software used with the Swartz POP server that would be needed to coordinate messaging. Swartz does not disclose a unified messaging system at least because the POP server Swartz discloses does not receive, store, retrieve and forward messages in a coordinated manner.

(ii) Claims 1 and 20: "said computer being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time"

I also note that Mr. Hyde-Thomson offers no opinion in his report as to whether the Swartz patent anticipates any asserted claim of the '064 patent under ALE and Genesys's proposed construction of the term single graphical menu recited in independent claims 1 and 20. Claims 1 and 20 call for a "single graphical menu for displaying said communication options for each of said communication services at the same time." ['064 patent col.18 ll.39-58, col.22 1.59-col.23 1.14] ALE and Genesys propose that the term single graphical menu should be construed to mean "one graphical menu that shows all of the communication options associated with the subscriber's communication services." [Hyde-Thomson 168.] In my opinion, the Swartz patent does not anticipate any asserted claim under ALE and Genesys' proposed construction of this term. Mr. Hyde-Thomson points to Figure 8 of the Swartz patent as a disclosure of the claimed single graphical menu. However, the menu shown in Figure 8 of the reference does not include all of the communications options associated with the subscriber's communications services. Figures 7, 9, 10 and 11, for example, all show additional subscriber communication options that are not displayed in Figure 8. Accordingly, the Swartz reference does not anticipate '064 patent under ALE's and Genesys construction of single graphical menu.

For at least these reasons, the Swartz patent does not anticipate claims 1 and 20 of the '064 patent. Swartz also fails to anticipate claims 3, 8, 9, and 11 of the '064 patent, which depend from claim 1.

> . 2. Opinion regarding U.S. Patent No. 6,636,587 to Nagai (filed June 24, 1998)

I have reviewed U.S. Patent No. 6,636,587 to Nagai (filed June 24, 1998) ("Nagai"). In my opinion Nagai does not anticipate claims 1, 3, 8, 9, 11, and 20 of the '064 patent. The Nagai

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patent relates to a computer-telephony integration ("CTT") system and an information reception processing method in which information (e.g., multimedia information with voice, text and image) sent from a device such as a computer, a cell phone or a facsimile machine can be automatically converted and transmitted to a similar or different device at a connection destination. [Nagai fig.1, (57).]

Document 172-8

Nagai does not anticipate claims 1 and 20 of the '064 patent.

Nagai does not anticipate claims I and 20 of the '064 patent at least because Nagai does not disclose the following limitations:

> Claims 1 and 20: "A computer-implemented control center for permitting a subscriber of a phrrality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services"

In my opinion, Nagai does not disclose the claimed unified messaging system. As shown in Figure 2 of the Nagai patent, the disclosed system includes a CTI server connected to a telephone network via a PBX and to various other servers, including a groupware server labeled as a "unified messaging system." Despite this label, the groupware server is not a unified message system.

The Nagai system is connected to the internet via an internet server. [Nagai fig 2.] The system receives e-mail messages directed to system subscribers at the groupware server via the internet server. A groupware control program running on the CTI server detects that a message has been received and loads the received message from the groupware server onto the CTI server. [Nagai col.19 ll.16-26, col.21 ll.16-22.] The CTI server reformats the message if necessary, then finally routes the message to the intended subscriber's device. As noted in the Nagai patent's abstract, the Nagai system only temporarily stores messages to process and route them to destination devices. [Nagai, at (57).]

Mr. Hyde-Thomson points to Figure 2 of Nagai and to a short portion of text in the reference describing a "groupware server 203 for providing a unified messaging service for unified messaging of voice, text and facsimile mail and a workflow management service of a work process." [Hyde-Thomson 186.] He argues Figure 2 and the cited text establish that Nagai discloses the claimed unified messaging system. I disagree. The text Mr. Hyde-Thomson cites does not explain what attributes Nagai's so-called "unified messaging system" possesses, and the proupware server that Mr. Hyde-Thomson points to cannot be a unified messaging system even under ALE and Genesys' construction. Nagai explains that the groupware server does not perform the conversions required to send messages to "communication devices or networks employed for the transmission of messages" as required by Microsoft's and by ALE and Genesys' construction. That task is performed by Nagai's CTI server. [See, e.g., Nagai col.8 1.39-col.9 1.36, col.21 11.9-64.] Thus, those skilled in the art would have understood that Nagai's use of "unified messaging system" is inconsistent with both constructions proposed in this case.

Furthermore, careful review of Nagai shows that it does not describe a "system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e., in a coordinated manner)," as Microsoft proposes the term unified messaging system should be construed. The Nagai system formats and routes messages from a source to a destination, but it does not coordinate retrieval and forwarding of messages as required of unified messaging systems.

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Mr. Hyde-Thomson's arguments support this position. Thus, Nagai does not anticipate any asserted claim under ALE's and Genesys' construction of the single graphical menu limitation.

For at least these reasons, the Nagai patent does not anticipate claims 1 and 20 of the '064 patent. Nagai additionally fails to anticipate claims 3, 8, 9, and 11 of the '064 patent, which depend from claim 1.

Nagai does not anticipate claim 8 of the '064 patent.

In my opinion, Nagai does not anticipate claim 8 of the '064 patent at least because it does not disclose the following limitations:

> (i) Claim 8: "The computer implemented control center of claim 1 wherein the first communication option includes a first routing option, and wherein the second communication option includes a second routing option"

In his report, Mr. Hyde-Thomson is unable to identify a single graphical menu that displays a "first communication option [which] includes a first routing option" and a "second communication option [which] includes a second routing option" as called for by claim 8. [Hyde-Thomson 201-02.] Mr. Hyde-Thomson quotes the Nagai patent at col.8 ll.3-6 and describes various services that the system offers. However, neither Mr. Hyde-Thomson nor the portions of Nagai he relies on describes displaying options. For this reason also, Nagai fails to anticipate claim 8 of the '064 patent, under either Microsoft or Defendants' proposed construction, and fails to anticipate claim 9, which depends from claim 8.

з. Opinion regarding the Octel Unified Messenger Product

I have reviewed documents including the "Octel Unified Messenger for Microsoft Exchange White Paper" ("White Paper") and the "Octel Unified Messenger Subscriber's Guide" ("Subscriber's Guide") which, according to Mr. Hyde-Thomson, describe the features of the Octel Unified Messenger Product ("the Octel product"). [See, e.g., Hyde-Thomson 205-06.] I

forward the received voice messages to additional recipients. Here the reference describes forwarding voice messages, not forwarding calls.

Thus, the Octel product and the Octel references do not anticipate any asserted claim under ALE's and Genesys' construction of the single graphical menu limitation.

 Opinion regarding U.S. Patent No. 5,742,905 to Pepe (filed September 19, 1994)

I have reviewed U.S. Patent No. 5,742,905 to Pepe (filed September 19, 1994) ("Pepe"). In my opinion Pepe does not anticipate claims 1, 3, 8, 9, 11, and 20 of the '064 patent. I note that the Pepe patent was specifically considered by the patent examiner during prosecution of the application that matured into the '064 patent, and applied as prior art against the pending claims which ultimately issued. The Pepe patent describes a personal communications interpetworking system ("PCI"), which provides a network subscriber with the ability to remotely control the receipt and delivery of wireless and wireline voice and text messages. [See, e.g., Pepe col.3 11.46-49.] Effectively, Pepe's PCI system is a message router which directs the flow of messages between wireless and wireline networks, performing media conversions as necessary. [See, e.g., Pepe col.5 L54-col.6 L10, col.27 Il.59-62, fig.22, fig.23.] Messages are maintained in a data messaging peripheral which stores messages in a post office protocol (POP) server. [See, e.g., Pepe col.10 Il.22-47.] Pepe includes a user interface that displays, non-simultaneously, multiple independent menus on a PCI subscriber's PDA screen [Pepe col.34 ll.12-13, figs.28-45]. For example, figure 35 of the Pepe patent depicts a mean displaying various email screening settings. [Pepe col.34 IL59-65.] Figure 38, on the other hand, depicts a different menu displaying various voicemail settings. [Pepe col.35 ll.52-57.]

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Pepe does not anticipate claims I and 20 of the '064 patent.

Pepe does not anticipate any asserted claim of the '064 patent because it discloses neither the unified messaging system nor the single graphical menu of independent claims 1 and 20. Pepe does not disclose the following limitations:

> Claims 1 and 20: "A computer-implemented control center for permitting a subscriber of a plurality of communication services of a unified messaging system to customize communication options pertaining to said plurality of communication services"

In the context of the '064 and '357 patents, Microsoft proposes that a unified messaging system should be construed as a "system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e., in a coordinated manner)." As noted above, Pepe stores messages on a POP server. [Pepe col.10 11.29-31.] A POP server does not receive, store, retrieve and forward messages in a coordinated manner. Furthermore, there is no teaching of any additional software used with the Pepe POP server needed to coordinate messaging. Accordingly, Pepe does not disclose the claimed unified messaging system.

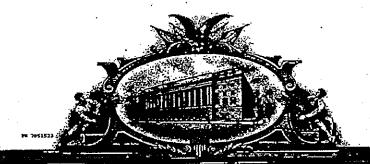
> Claims 1 and 20: "said computer being configured to generate a single graphical menu for displaying said communication options for each of said communication services at the same time"

In addition, Pepe does not disclose a "single graphical menu for displaying said communication options for each of said communication services at the same time," as recited in claims 1 and 20 of the '064 patent. Mr. Hyde-Thomson suggests that Figures 33-35 of the Pepe patent disclose the claimed single graphical menu limitation under both Microsoft's and ALE/Genesys' proposed construction. Under both of these constructions, the single graphical

X. FURTHER COMMENTS

My correct opinions are set forth in this report. As my analysis and investigation of the case continues, I may acquire additional information and/or attain further insights relating to my opinions. I specifically reserve the right to supplement this opinion in response to any additional information that becomes available to me, any matters raised by Defendants and/or opinions provided by Defendants' expert(s), or in light of any relevant orders from the Court, including the Court's claim construction order. Moreover, I may make additions, deletions, or modifications that would be reflected in my trial testimony. For trial, I expect to prepare diagrams, charts, and demonstratives to illustrate the issues presented. I also understand that I may be asked to prepare a rebuttal report and to give rebuttal testimony at trial on matters not covered in this expert report.

Date: 4/18/2008



TO MILTO WHOM THESE; PRESERTS SHAM, COME;

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office

March 05, 2007

THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS OF:

APPLICATION NUMBER: 09/239,585

FILING DATE: January 29, 1999 PATENT NUMBER: 6,263,064 ISSUE DATE: July 17, 2001

By Authority of the

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office

Certifying Officer.

MSAL 00761

Three listings are included in the method: 1) associating a telephone number to a tag, 2) storing tags in a quick sequence and 3) activating a quick response (Col 3-5). The listings show the portion of interaction after the subscriber places a call to an 800-type telephone number to connect to the automated attendant and after he/she has successfully completed any login procedures to begin administering his/her personal telephone number. In the third listing, Feit states, "To turn a quick sequence or quick follow me destination on or off, press 2 (Col. 5, lines 30-31)."

Bissel discloses a method of forwarding telecommunication calls to individuals when they are away from their normal location. More particularly, a telecommunication subscriber who is traveling away from his or her home or office can have calls forwarded to a different location that is determined automatically when the subscriber engages in a transaction or activity that indicates his/her location. The transaction or activity can be any action that causes an electronic database to be updated with information that directly or indirectly is indicative of the subscriber's whereabouts, either specific or general. It is not necessary for the subscriber for the subscriber to remember to specifically to update his/her database record.

Claims 1-9 and 20-30

In contrast to Pepe, independent claims 1 and 20 of the present application require a single graphical menu that is arranged to display the communication options for each of the communication services at the same time. That is, the communication options for each of the communication services are simultaneously displayed on a computer terminal when the subscriber employs the display terminal to access the computer-implemented control center through a data-centric network. In essence, the graphical menu serves as a centralized visual interface or control panel for reviewing and/or customizing the communication options associated with various communication services. As should be appreciated, by providing a single graphical menu, a user may quickly and conveniently review the communication options and make changes thereto. Claims 1 and 20 have been amended to better clarify this aspect of the invention.

While Pepe may disclose the use of control options and subscriber profiles, Pepe does not contemplate a single graphical menu where only one view is used to display the communication options. Rather, in Pepe, the subscriber must go through a plurality of views independently,

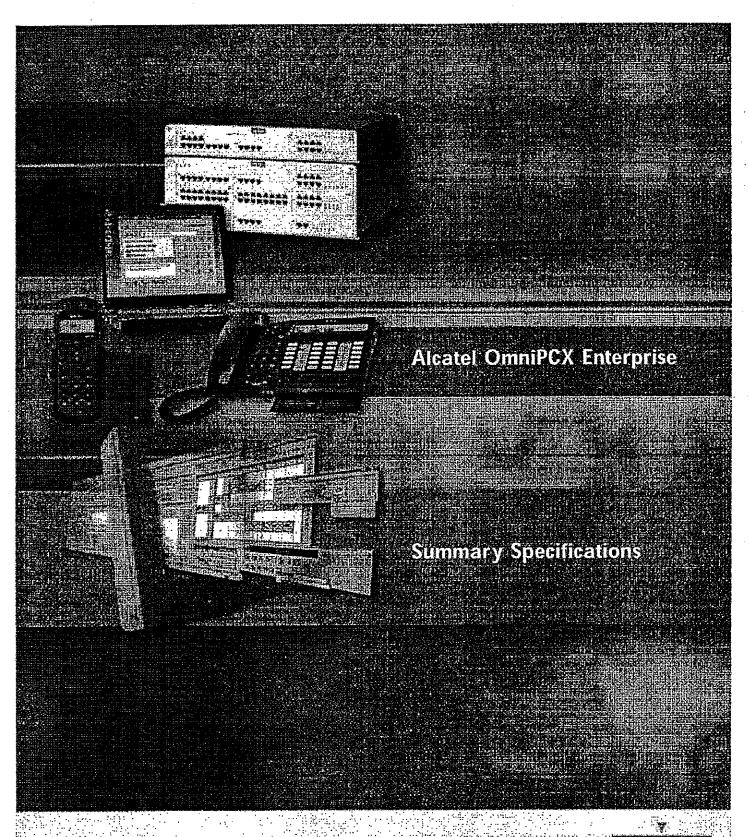
wherein the options are displayed at different times (See, Col. 34, Line 10 - Col. 36, Line 51 and Figures 28-45). In order to access all of the screens in Pepe, a subscriber must traverse through at least 18 screens as shown in Figures 28-45. In contrast, the present invention does not have to access multiple screens to modify options. In fact, the communication options, which are displayed on a single screen, may be modified as needed with a few keystrokes. Accordingly, it is respectfully submitted that a single graphical menu containing the communication options is neither disclosed nor reasonably suggested by Pepe et al. Furthermore, claim 20 of the present invention, as amended, additionally requires that the communication options be visually presented on a display terminal via an individualized web page associated with the subscriber. As should be appreciated by the Examiner, Pepe is silent to subscriber web pages.

With respect to the secondary references, it is respectfully submitted that the addition of Feit and Bissel to the Pepe patent does not cure the deficiencies of the Pepe et al. patent discussed above. It is the applicant's understanding that each of the cited references completely fails to suggest visually displaying a single graphical menu.

Therefore, for at least the reasons above, it is respectfully submitted that the art of record neither discloses nor reasonably suggests the invention as currently recited in claims I and 20. Accordingly, it is respectfully submitted that claims 1 and 20, as amended, are patentable over the art of record.

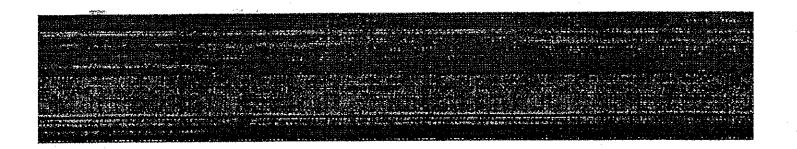
Claims 2-9, and 21-22 (as well as new claims 23-30) each depend either directly or indirectly from claims 1 and 20 and are therefore respectfully submitted to be patentable over the art of record for least the reasons set forth above. They also require additional elements that when considered in light of the claimed combination further patentably distinguish the present invention.

For example, claim 6 of the present invention, discloses a follow-me service, a follow me service enable option, and a set of numbers. The follow-me service enable option when enabled by the subscriber, permits "a caller" (not a subscriber) to elect to forward a call to a telephone associated with the set of telephone numbers. The follow me service gives the subscriber the ability to designate a set of telephone numbers where he/she may likely be found and gives the caller the option to try and find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. From the caller's perspective, the follow me service is an on-



ARCHITECTS OF AN INTERNET WORLD ATCASES

ABS00004938



What does it take

to become the most awarded IP Telephony system in the world?



It takes a century of engineering excellence and listening to customers to deliver the Alcatel OmniPCX Enterprise, a communications solution that...

- ... empowers everyone in your business through architectural flexibility. The OmniPCX Enterprise provides consistent features to all users over all media, whether they're working on your premises, on the road, or even from home.
- ... offers a contact center with intelligent networking and superior customer interaction through multimedia tools.
- ... enables an agile workplace with distributed knowledge, flexible deployment of new applications, and cost savings all in one.
- ... offers simplified management that is always on and is accessible from any Web browser. It has the ability to manage users, resources, and services across the entire Enterprise.
- ... delivers headquarter survivability to the branch.
- ... provides moveable software licenses that allow you to move your licenses anywhere, anytime, across your enterprise.
- ... is a highly scalable (6 to 50,000 users) and flexible system that allows you to evolve your legacy systems as your needs dictate protecting your existing investment.

Alcatel IP Telephony has won the most awards because in addition to all of these benefits it offers hundreds of other features and capabilities. The Alcatel OmniPCX Enterprise is the world's most advanced, future-proof communications system that offers risk-free migration to IP without compromising on features.













Software	
Client-server	ÜNİX System V compliant
Chorus MiX micro kernel operating system	Linux LILO/GRUB compliant*
SQL/CQL database	Linux Red Hat* & Mandrake 7.2

Alcatel Enterprise technology offers:

Distributed hardware Processing Switching Power supply Auxiliary Native Ethernet connectivity

and the first first commence of the state of

Main CPU duplication available in all configurations (Inside Media Gateway or LAN attached)

Optimized hardware for IP only and multiple remote site designs

Cabinets Alcatel OmniPCX Enterprise RM1 (19" rack)

Three modular slots (stackable up to 3 with RM3)

Takes optimized hardware modules (or/and e-CS communication server)

Depth 15.75 in./400 mm Height 2.60 in./66 mm Width 17.40 in./442 mm

Alcatel OmniPCX Enterprise RM3 (19" rack)

Nine modular slots (stackable up to 3 with RM1)

Takes optimized hardware modules (or/and e-CS communication server)

Depth 15.75 in./400 mm Height 6.06 in./154 mm Width 17.40 in./442 mm

Alcatel OmniPCX Enterprise Voice Hub (19" rack)

ACT four slots, expandable to eight

Integrated power supply

Integrated maintenance modem

Depth 14.17 in./360 mm Height 6.30 in./160 mm Width 17.72 in./450 mm Weight 33.06 ib./15 kg Alcatel OmniPCX Enterprise M2 (cabinet)

1 ACT 28 or 2 ACT 14

Depth 10.04 in./255 mm
Helght 29.13 in./740 mm
Weight 22.44 in./570 mm
Weight 154.32 lb./70 kg

Alcatel OmniPCX Enterprise M3 (cabinet)

2 ACT 28 or 2 ACT 14

Depth 20,31 in./516 mm Height 59.05 in./1500 mm Width 22.4 in./570 mm Weight 242.5 lb./110 kg

Alcatel OmniPCX Enterprise WM1 (cabinet)

Width 12.72 in./458 mm
Height 27.95 in./710 mm
Depth 10.04 in./255 mm
Weight 55.11 lbs./25 kg

Power supply: 110 V/48 V, 220V/48V

Norms UL/CSA

FCC/IC compliance

Part 68 CS-03











^{*}Release 5.0 Units supported using Optimized Hardware or Appliance Server (IBM, etc.).



Document 172-8

Reflexes Telephones

The Alcatel Reflexes telephones are easy to use and offer a rich set of features that simplify and empower communications. Alcatel offers a complete line of IP and digital Reflexes telephones. The digital Reflexes phones are connected by an Alcatet high-speed digital interface at 256 Kbps (3B+D) using standard two-wire telephone cabling.



Alectal 4025 Advanged Daffavor	Alcard 4035 IP Advanced a Polleyes
Reflexes phones,	en esse asince mentions should be not a distribute

Alcatel 4020 Premium Reflexes

Alcatel 4010 Easy Reflexes

Alcatel 4004 First Reflexes

Alcatel 4020 IP Premium e-Reflexes

Alcatel 4010 IP Easy e-Reflexes

Modules adding keys to a telephone set

Alcatel 4090 M: 20 keys

Alcatel 4090 L: 40 keys

Alcatel 4095 analog line plugware

Alcatel 4093 ASY asynchronous V.24/CTI Communication protocols: V.25bls, Hayes Rate adaptation: V.110/V.14 E

Alcatel 4098 IP Reflexes phone enabler gives you a simple upgrade to digital Reflexes

IP Services

G.711 voice coding

G.723.1 & G729a compression algorithm

H.323 compliant

SNMP agent (MIB2)

DHCP client

10/100 switch function (allows PC to be attached to phone)

QoS: RTCP monitoring IEEE 802.1p/Q, ToS, DiffServ

Power AC or 802.3af

SIP gateway and H.323 internal Gatekeeper services Integrated in optimized hardware or appliance server (IBM etc.)

Supports the use of Alcatel UA based IP phones, third party SIP phones and any H.323 devices

SIP Proxy and SIP Client registration using embedded URL

H.323 Gateway registration and translation of E.164 into IP



b based telephony software Soft keys
Call planning
Call related notes
Groupware services
NetMeeting compliant
TAPI, MAPI, DDE, OLE.com, LDAP
Interworking with Lotus Notes & M/S Outlook
Kit/library for developers such as Alcatel's XML Telephony API v1.0

Alcatel 4961 TAPI Middleware for PC workstation

Alcatel TAPI Premium Server: TAPI 2.1 / 3.0

Informative icons

Absence message	Interactive guidance with soft keys	
Adjustable handset volume	Language synchronization: display, voice prompts, and voice mail	
Call-by-name: internal and external user		
Centralized directory, spelling and syntax adjustment	Loudspeaker announcement	
Call-by-name can be used in all communication contexts (direct call, inquiry, and more)	Multi-line: multi-appearance and multi-numbers	
	Multilingual (user choice)	
Caller name display	Macro commands	
Conditional/unconditional differentiated forwarding of multiple directory numbers	Message waiting indication	
	Mini-text messages	
Contextual voice prompts	Personal password for consultation of non-reply	
Fixed function keys	personal calls log	
Handsfree	Programmable function key	
Headset capability	Supervision of user/trunk/bundle	
Help key	•	
Individual customization		



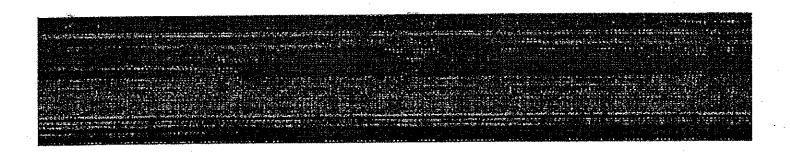
Calling line identification presentation/restriction	ISDN mini-text messages (carrier dependent)	
(CUP/CUR)	Malicious call identification	
Digit by-digit dialing mode	Storage of unanswered calls with date, time, and callback	
End block dialing (digit correction possible)		
ISDN Identification (CLIP) converted into name	Sub-addressing	

Elia plack malling (digit correction possible)	CONDOLK	
ISDN Identification (CLIP) converted into name	Sub-addressing	
Manager assistant team	Managerassistant specific on-line text-messaging	
Access to manager's voice message headers from assistant's telephone	Manager discreet listening (on filtered lines only)	
Filtering scenario allocation to designated assistant	Overflow assistant in case of main assistant absence Private lines Main assistant absence notification and overflow assistant Selective filtering (scenarios)	
Flexible configuration: multiple manager/assistant team		
Forwarding of private line		
Immediate forwarding of manager telephone to assistant activated by manager or assistant		
Teamwork configuration		

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Common/exclusive hold	Log-on, log-off
Group call pick-up	Manageable ring indicator
Hunting groups	Manageable waiting queue



Standard telephone features	ENTRE STREET, SERVICE STREET,	
Speed dialing	Intrusion	
Account code charging	Last internal/external number redial	
Appointment reminder	Local and external call	
Associate (definition, modification by user)	Moving service	
Automatic call-back on busy trunk/bundle/network link	Multi-line selective forwarding	
Automatic call-back on free/busy extension	Multiple conference call	
Broker's call	Multiple call protection	
Call forwarding unconditional on busy/no reply to extension, hunting group, voice mail, operator,	Multi-tenant services: Speed dialing numbers per entity	
paging, etc.	Calling line identification Integrated auto attendant services per entity	
Call pick-up		
Call waiting indication	Presentation (CUP) per entity	
Calling line identification restriction for internal calls	Greeting message per entity	
Camp on busy telephone/hunting group/voice mail	Music on hold per entity	
Conditional external forwarding (busy or no reply)	Night service per entity	
Waiting call	Over dialing	
Controlled private call by PIN code and password (optional)	Personal code modification Priority call	
Distinctive ringing according to hierarchical levels	Store and redial external number	
Do not disturb	Substitution	
General night service	Three-party conference	
Hunting group (fix head, cyclic, longest idle time, parallel)	Transfer in conversation on free/busy telephone	
Immediate forwarding	29 party meet me conference	
Individual hold	Voice prompts on/off per telephone	
Individual directory	Voice message deposit on forwarded telephone	
Internal/external music on hold	Waiting call consultation	
Internal/external inquiry call		

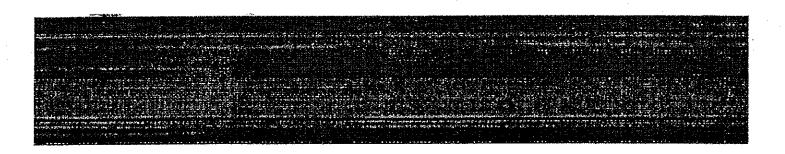




Wireless Reflexes - PWT services			
Caller's name display	Multi-line		
Dial by name	Range of gain antenna		
Encrypted communications	ations Roaming		
Hand-over .	. PWT service .		
ISDN services	Voice mail notification/consultation		
Mini-text messages			
Optimized radio base station Six simultaneous communications			
Connectivity 2 x UA interfaces			
Inline powered			
Connections handled by the Alcatel Omr External caller waiting on voice prompt	IPCA chierphise. LSFA 3 protocol		
External caller waiting on voice prompt			
Internal and external calls transferred to	pager:		
On selection			
Immediate forward			
No reply or busy			
Paging by prefix or suffix	<u> </u>		
Ubiquity services Integration of public cellular phone			
One number concept, forward call on cal	ller choice:		
Voice mail			
Cellular phone			
Attendant/assistant			
Remote access secured by CLIP, access to	•		
Call by name			
Office set management			
. Alcatel OmniPCX Enterprise regular telep	hone services		



Attendant station		
Attendant station	Large busy lamp field	
Abbreviated dialing	Flexible attendant routing time out overflow based or caller waiting time	
Activation/deactivation of DND		
Add-on module	Headset capability	
Alarm Indication	Hold individual or multiple	
Attendant groups	Create/delete of directory Items	
Automatic answer	Internal call name/number displayed	
Attendant specialization options (individual or group)	ISDN VIP monitoring	
Busy lamp field	Last number redial	
Call-by-name in all communication situations	Line reservation	
Call charge request (carrier dependent)	Malicious call Identification	
Centralized or distributed attendant in network	Manual reservation mode	
Call queuing with indication	Mini-text messages	
Call routing depending on class of traffic. DID,	Multi-tenant services	
company, or called service (entity)	Override on directory number	
Call waiting with indication	Paging	
Called party resources	Password	
Call pick-up	Personal call	
Charging recall service (carrier dependent)	Priority call (internal/external)	
Chained call	Receipt and read charging units and costs (carrier	
Choice of system status	dependent)	
Conference	Record on line on associated entity	
Creation, cancellation, and modification of	Status of calls routed to operator	
abbreviated number with name	Store and number redial	
Creation, cancellation, and modification of subscribers (name, rights, and more)	Synchronized multi-node routing (entity)	
Discrete call offer	Time and date displayed	
Discrete call offer by mini-text messages on busy/free	Transfer with/without announcement	
	Trunk allotting with barring	
Reflexes telephone	VIP telephone monitoring	
DTMF over dialing		





Integrated greeting.

Case 1:07-cv-00090-SLR

Integrated automated attendent

Personal automated assistant with context-sensitive greeting

Synchronized greeting message

Voice and fax mail

Automated attendant

Call transfer

Direct reply on receipt message

Extended recording, and playback control function

Fax broadcast, on demand, overflow, store, and forward

General distribution lists

Greeting message according to user status

Immediate or supervised transfers

Message acknowledgment

Message attributes: urgent, normal, private

Message notification via light, display, dialing tone, voice prompt, outgoing

Multi-language

Multi-user password

Networking protocols: Octelnet and Amis

Private distribution lists

Record on line

Shared mall box: home, guest, and assistant mailbox

User-friendly interface on Reflexes telephones via soft keys or via PC-client visual messenger

Voice message attached to a fax

Voice and DTMF forms

Web access to voice and fax messages

Embedded software based voice mall for small/medium sites (branch autonomy) known as the Alcatel 4645

Active matrix call distribution

Call flow based on pilot

Skill and cost based distribution

Conditional pilot overflow on voice mail

Look ahead call routing

Pilot forwarding to other pilot

Pilot routing to waiting queue according to priority

Routing time schedule

Types of queues: waiting, help, and dissuasion

Virtual pilot

Intelligent routing

Outbound call management

Direct agent call management

Remaining wait time announcement

Genesys Contact Center direct interface using RSI

Voice guidance

Externat voices guides

Synchronized internal voices guides

Storage from audio station or Reflexes telephone

Alcatel OmniPCX Enterprise

Automatic call distribution (ACD)/Alcatel OmniPCX Enterprise OmniTouch (cont.

Agent features

Administrative withdrawal

Agent break

Agent direct call with statistics

Agent can belong to different groups

Call recording

CCA applications: Reflexes telephone on toolbar

providing personal statistics

Group selection: fix head, cyclic, longest idle time

Free sitting agent position

Help supervisor

Home agent with analog telephone or Reflexes

telephone

Log-on/log-off

Open or close pilot from agent position

Personal call barring

Suspension of group waiting queues

Transaction code

Wrap-up (automatic or manual)

Supervision and statistics

Alarm handling

Call level information

Customizable alarms

Customizable reports

Detailed communication reports

Reports based on communication events

Discrete call listening for supervisor

Excel based statistics and reporting

Export of communication reports (ASCII files)

Free sitting supervisor position

Full Windows user interface

Native Windows management look and feel

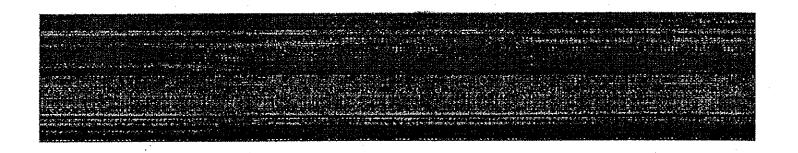
Predefined reports

Real-time service tevel per pilot

Real-time statistics

Statistics compilation and archive (FTP)

Waliboard display control



Document 172-8



Network configuration

Analog and digital Alcatel networking protocol (ABC) based on QSIG

Line, star, meshed configuration

Remote shelf (ACT)

RM1/RM3

Multi vendor networking; QSIG BC, GF, and supplementary services (SS)

Built-in compression engine

Compression algorithm G 723.1/G729.A

Compression rate 6.4 Kbps/8 Kbps

G3 fax supported

End-to-end compression/decompression

Pooled IP/FR compression resources

Multiple direction per compression board

Voice over IP (using Universal IP Board)

Compression algorithm: G 723.1, G729.A

Compression rate 6.4 Kbps/8 Kbps

G711 supported

G3 fax supported

Media gateway over IP support

Full ABC services supported

Ethernet connectivity

H.323 v2 (e.g., third party trunks)

New call routing in case of QoS or network failure

Voice over frame relay

Compression algorithm: G723.1, G729.A

Compression rate: 6.4 Kbps/8 Kbps

G3 fax supported

Full ABC services supported

Interface Internet X24/V11 or V36

New call routing in case of network failure

Voice over AYM

ATM adaptation layer AAL1

Compliant with integrated compression engine

Full ABC services supported

Interface ATM OC-3 155 Mbps

Eight directions per interface

Unstructured mode service (CES 1.0)

UNI 3.1

ABC on demand:

ABC via public ISDN, QSIG

Dynamic virtual leased line

Six conversations on 64 Kbps B channel

Five conversations on 56 Kbps B channel

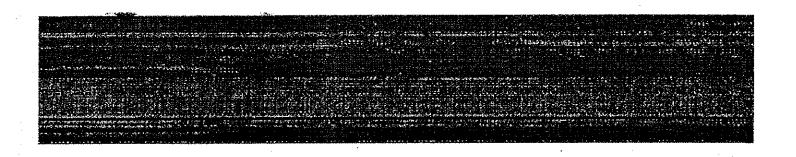
Call barring for applications

Full ABC services

Alcatel OmniPCX Enterprise

Adaptive routing	Automatic route selection (ARS)
Break-in/out	ARS server centralized or distributed
Break in via secured DISA	ARS time dependant
Data rerouting	Access to alternative route
	Voice prompts
Forced on net	Multiple carrier access - direct or indirect
	Multi-tenant
•	Cost limit barring per user
	Overflow if leased line failure or saturation according to user rights
	Transfer, forwarding with route optimization
	Voice/data differentiation

Private nativorking features (ABC protoco Automatic call-back on busy private link	Hold	
Broker's call	Hunting groups	
Call-back on busy or free extensions	Intrusion	
Call deflection	ISDN services	
Call forwarding	Large busy lamp field	
Call intrusion	Mini text messages	
Call offer	Number and name identification	
Call waiting indication	Associate telephone	
Сатр оп	Priority calls	
Centralized/distributed attendant groups	Remote forwarding	
Data communication	Substitution	
Network wide mobility	Supervision	
Roaming	Manager/assistant team	
Guest services	Three-party conference	
Distinctive ringing	Transfer (with route optimization)	
Do not disturb	Transit	
DTMF	Voice mail services	
Inquiry call	Unified messaging services	
Flexible numbering plan		





ABC VPN via overflow to public ISDN, QSIG

Dissociating signaling over IP network (lower bandwidth)

Six conversations on 64 Kbps B channel

Five conversations on 56 Kbps B channel

Full ABC services

Management from attendant

Multiple DDI translators

Multiple call barring translators

VT 100 local management

Centralized or distributed management from external applications

Topology map

Configuration

Alarm management

Call accounting

Directory

Traffic analysis

Security

Graphical user interface

Remote management

Alarm domains and alarm centralization

Audit mechanism

Broadcast of configuration data

Remote maintenance access

Remote software downloading

CDRs with VPN and LCR services

Internal toll fraud protection		Strong	authentication

PIN code for business calls

PIN code for personal calls with/without call barring

Transfer/forwarding barring categories

DISA protection

Password control and access blocked after several wrong attempts

Alarm generated in case of wrong attempt

Automatic substitution on CUP

on via secured ID

Controlled access to the OmniPCX Enterprise database

Protection by password

Identification of a management platform by name and password

Management operations history file

Remote management access controlled by CLIP (ISDN)

Call-back procedure (PSTN)

Internet/intranet access protection

Trusted host: IP address control

TCP wrapper: secured exchange control



Page 40 of 50

Alcatel OmniPCX Enterprise

Centralized or distributed management via Windows NT application

Client-server architecture (Windows 95/98/NT client)

Web-based management for full access

Embedded "expert tool" in new optimized hardware via browser

Move, add, and change

Unified graphical Interface

Profiles for creation/modification

Import/export from text files

Moveable software licenses across nodes*

Faults and alarms

Alarms filtering

Alarm list with colors according to severity

Alarm display on topology maps

Call accounting

Document 172-8

Organization map

Time-based cost calculation

Carrier cost simulation

Predefined/customizable graphical reports

Reporting services

Multiple report formats (csv, html)

Reports distribution by e-mail

Performance

Traffic analysis per: trunk, bundle, attendant/attendant group, ansite wireless installation DDI number

Convergence with HP OpenView

Topology map animated by OmniPCX Enterprise

SNMP traps Access to OmniPCX Enterprise node

from topology maps

All types of phones: analog, Reflexes, wireless

Check-in/check-out individual or group

Pre check-in/partial check-out

Cyclic DDI

Multi occupant room

Room allocation from the telephone

Do not disturb

Guest/patient personal code

Internal call barring

DDI call barring according to time schedule

Wake-up service (up to four wake-up calls per room)

Room service

VIP.

Guest number or name

Called service identification

Guest language

Room status

Multi-language voice prompts (eight simultaneous languages)

Room directory

Call by name

Prepayment (deposit)

Flexible suites

Alcatel hotel/hospital link (AHL)

Secret identity for calls between rooms

Public booth

Guest personal identification number

Manual CDR creation

Mini-bar

Billing

^{*}Supported using Linux architecture only.



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EXHIBIT 20

REDACTED

1.1

EXHIBIT 21

Case 1:07-cv-00090-SLR

Document 150

Filed 05/02/2008

Page 1 of 6

UNITED STATES DISTRICT COURT DISTRICT OF DELAWARE

MICROSOFT CORP., Plaintiff,

V

ALCATEL-LUCENT ENTERPRISE and GENESYS TELECOMMUNICATIONS LABORATORIES, INC., Defendants. Civil Action No. 07-090-SLR Hon. Sue L. Robinson

Jury Trial Demanded

JOINT CLAIM CHART

Per the Court's scheduling order, the parties submit the following joint claim chart outlining the terms for which there is a claim construction dispute. At issue are three terms in the '439 patent, four in the '289 patent, and seven in the '357 and '064 patents. For convenience, those terms, as well as the parties' proposed constructions, appear below.

4. 4. 5. 7. 7. 1. 20		2499 patent all services	
Term	Appears in	MS: Proposed Constr	Defs. Proposed Consing
"telephone	All asserted	"network for carrying	"network for carrying
network"	claims	telephony information"	telephony information
			originated by telephones"
"computer	All asserted	"network for carrying	"network for carrying
network"	claims	digital data"	digital data originated by
			computers"
"current activity	All asserted	"current status of	"whether the calling party
of subscribers on	claims	subscribers on the	is present on the computer
the computer		computer network or	network or the called party
network or		according to current status	is present on the computer
according to		of the user on the computer	network"
current activity of		network"	
the user on the			
computer			·
network"			
"the controller	Claims 1, 2 and	The parties agree to the follo	
accessing the	9	"hardware or software that a	
user-selectable		criteria in the one or more lis	
criteria in the one		the computer network access	
or more lists of		the user-selectable criteria to	the incoming cair
the data structure			•
via the computer			
network access	•		
port and thereby			•
applying the user-	ľ		·
selectable criteria			
to the incoming			·
call"	<u> </u>	<u> </u>	

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		289 patent care at a second	
Terms and	Appears In	MSProposed Constr	ADefs. Proposed Constrain
"telephone	All asserted	"network for carrying	"network for carrying
network"	claims	telephony information"	telephony information
			originated by telephones"
"computer	All asserted	"network for carrying	"network for carrying
network"	claims	digital data"	digital data originated by
			computers"
"monitoring	All asserted	Phrase does not require	"determining whether a
activity of a user	claims	construction.	called party's computer is
computer"		If construction is required:	active or idle"
<u> </u>		"monitoring the status of a	
	·	user computer"	
"at the computer	All asserted	Phrase does not require	"receiving at the computer
network, receiving	claims	construction.	network an indication from
information from	·	If construction is required:	the telephone network that
the telephone		"receiving at the computer	a first party requests to set
network that a		network information from	up a telephone call with a
first party from		the telephone network that	second party prior to the
whom a call is		a telephone call from a first	time the call is placed by
originating desires		party to a second party has	the first party"
to establish		been initiated"	
telephone			
communication			
with a second	·		<u> </u>
party"			<u> </u>

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		064 and 3574 patents see 1890	
e sellerine sel	Appears In	WIS/Proposed Constr	
"unified	All asserted	"system that allows	"system that allows
messaging	claims	messages of a data-centric	messages of a data-centric
system"		network and a telephony-	network and a telephony-
		centric network to be	centric network to be
		received, stored, retrieved,	received, stored, retrieved,
		and forwarded without .	and forwarded to the
		regard to the	communication devices or
		communication devices or	networks employed for the
		networks employed for the	transmission of the
		transmission of the	messages"
	•	messages (i.e., in a	
		coordinated manner)	
"communication	All asserted	"settings that control how	"parameters associated
options"	claims	communication services	with specific types of
		will be handled"	communication services"
"[first/second]	Claims 1, 3, 8, 9	"communication option	"an option that allows a
enable option for	and 11 of the	that controls the extent to	subscriber to turn on or off
enabling or	'064 patent;	which a communication	a communication service"
disabling the	claims 1, 6 and	service is implemented"	
[first/second]	17 of the '357		:
communication	patent	·	
service"			·
"a single graphical	All asserted	"a single graphical menu	"one graphical menu that
menu for	claims	for displaying at least a	shows all of the
displaying said		first communication	communication options
communication		service and option and a	associated with the
options for each of		second communication	subscriber's
said		service and option at the	communication services"
communication		same time"	,
services at the			
same time"			sc 3*7 7
"audibly	Claim 1 of the	"audibly representing	"audibly representing the
representing said	'357 patent;	communication options	same options available
communication		pertaining to at least two	through the graphical menu
options to one of		communication services to	to one of said telephones,
said telephones		a telephone using said	using said telephony
using said		telephony server, when a	server, when said
telephony server,		subscriber employs one of	subscriber employs said
when said		the telephones to access the	one of said telephones to
subscriber		computer-implemented	access said computer-
employs said one		control center"	implemented control
of said telephones			center"

control center"

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			•
		064 and 2357 patents	
Term	Appearsun .	MS Proposed Constr.	Defs: Proposed Constr.
to access said			<u>.</u>
computer-			
implemented			
control center"			
"an audible	Claim 17 of the	"an audible representation	"an audible representation
representation of	'357 patent	of communication options	of the same options
said		pertaining to at least two	available through the
communication		communication services	graphical menu to one of
options capable of		capable of being provided	said telephones, using said
being provided to		to one of the telephones,	telephony server, when
one of said		using said telephony	said subscriber employs
telephones, using		server, when a subscriber	said one of said telephones
said telephony		employs one of the	to access said computer-
server, when said		telephones to access the	implemented control
subscriber		computer-implemented	center"
employs said one		control center"	
of said telephones			•
to access said		ļ	
computer-			
implemented			
control center"			
"telephony server	All asserted	"telephony server being	"a telephony server that
being configured	claims of the	configured to audibly	represents the same
to audibly	'064 patent	represent communication	communication options
represent said		options pertaining to at	that are available through
communication		least two communication	the single graphical menu"
options to said		services to a telephone	
telephone when		when the subscriber	
said subscriber		employs said telephone to	· ·
employs said		access the computer-	
telephone to		implemented control	
access said		center"	
computer-			
implemented			· · ·
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